MARCH 29, 1958
VOL. 154 — NO. 13

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

MICROFILMING POPULAR

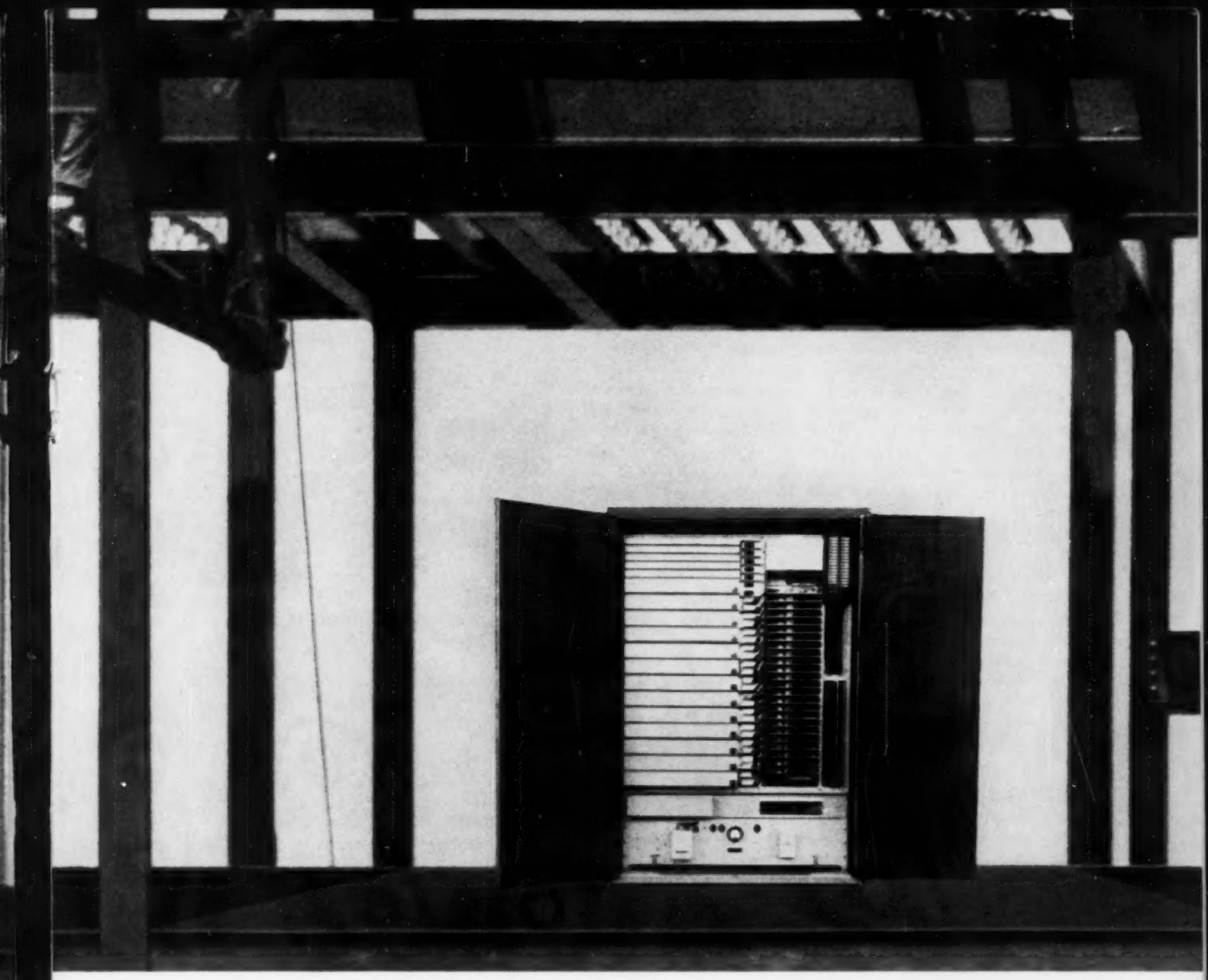
More and more Independent companies are installing equipment for micro-filming toll tickets. Above are employes of Consolidated Telephone Co. of Florence, Ky. (3,500 stations) operating unit it recently installed.

Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Subscription $4.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

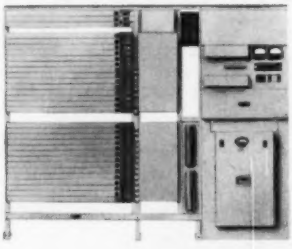
VAC Guaranteed Circulation This Issue 12,280 of Which 11,694 Is Paid

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

● REVENUE BUILDERS...The heart of an industrial, institutional or commercial building is its communications system. These dial PBX's by Stromberg-Carlson -- the F-40 and F-80 -- meet the needs of a wide range of subscribers. The F-40 is small, compact, quiet in operation. You can easily roll it anywhere, place



it where you like, because it's styled as modern office furniture. The F-80, with its larger capacity, is



ideal for your bigger commercial subscribers. For details consult your Stromberg-Carlson representative.

STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ELECTRONIC AND COMMUNICATION PRODUCTS FOR HOME, INDUSTRY AND DEFENSE

FLASHES AND PLUGS

LOST IN THE UNDERBRUSH. *Food Topics* magazine reports on the helping hand Stevens Stores in Miami, Fla. have given to the Robinson Crusoes of the supermarkets, the customers who "just can't seem to find anything."

The stores, each boasting 30,000 square feet of shopping area and 17 checkouts, have installed "courtesy telephones" which advise the puzzled shopper of the location of any item desired.

Albert Elkins, director of operations of the two stores, which for years have been distributing floor plan directions to customers, considered the added service, "well worth the monthly telephone charge."

"After all," Mr. Elkins said, "you can't buy what you can't find."

•

CUSTOM TAILORED. An unidentified man telephoned Arthur Boyle's clothing store in Preston, England and said he was interested in buying a raincoat.

He specified the style, color and chest size (42 inches) and asked that it be put in the store window so he could take a look at it. The store complied.

The only thing stolen in a window-smashing raid two days later was the raincoat.

•

SORRY, RIGHT NUMBER. The telephone rang at a Milwaukee Wis. athletic club the other day and when the switchboard operator answered, the caller said she had the wrong number.

The telephone rang again a moment later and it was the same woman. She hung up. As quickly as she could dial the number again, the telephone rang a third time.

"Athletic club," answered the operator.

"I don't know why you keep answering this phone," the exasperated caller said. "I'm not calling you. I'm calling Chapman's."

•

PERSONAL CHOPPING SERVICE. A personalized telephone service supplied by a butcher in Albany, N. Y. helps housewives not only order their meat but supplies advice on how the cuts should be cooked, according to *Food Topics* magazine.

"Our purpose," explained owner Sam Tabachnek, "is to give the housewife an opportunity to get her choice of meat personally selected for her and set aside by men who know the business. If she wants a few hints on how to cook the meat, they are readily available."

This service by telephone helps bring back the personal touch of the good old days, Mr. Tabachnek stated, when grandma and the butcher used to discuss each purchase.

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1904

March 29, 1958

CONTENTS

EDITORIAL—EXCISE TAXES MUST BE REMOVED ... 17

MISTER DOOLEY ON THE TILLYPHONE ... 19
By Francis X. Welch

DESIGN AND OPERATION OF SMALL COMPANIES—Part 13 ... 21
By R. J. Pollock

ECONOMIC SELECTION STUDIES—Part 4 ... 23
By John D. Dresser

TELEPHONY'S ELECTRONICS SECTION ... 31
By Harold B. McKay

THE PLANT MAN'S NOTEBOOK ... 30
By Ray Blain

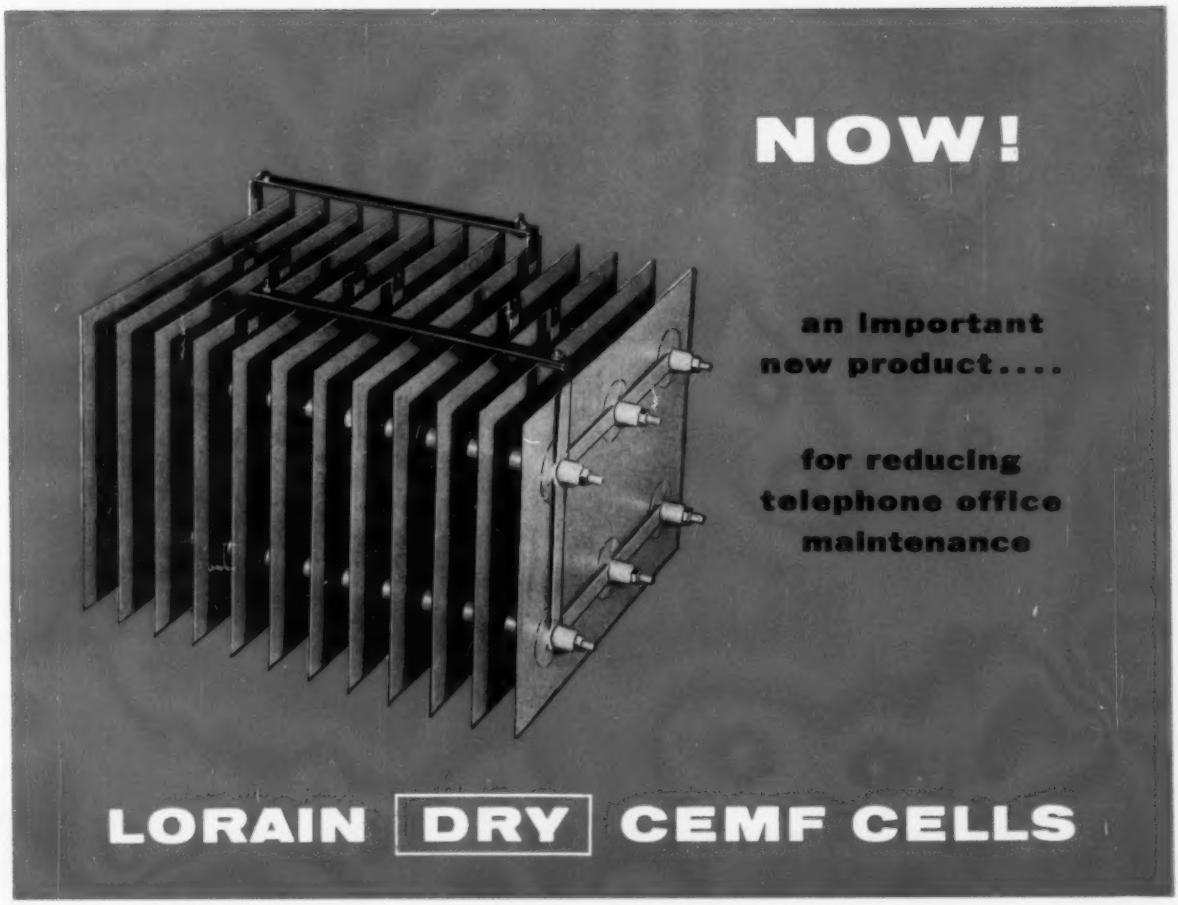
TODAY'S HIGHLIGHTS OF FINANCE, TAXES, BUSINESS TRENDS ... 38
By Willard F. Stanley

COURTS AND COMMISSIONS ... 42

H. D. FARGO JR., *President and Director of Advertising* • A. J. STULTS, *Vice President and Advertising Manager* • R. C. RENO, *Vice President and Editor* • DAN S. FARGO, *Vice President and Managing Editor* • DIANNE P. DRUCKER, *Associate Editor* • FRANCIS X. WELCH, *Washington Editor* • RAY BLAIN, *Technical Editorial Director* • HAROLD B. McKAY, *Electronics Editor* • MAYME WORKMAN, *Traffic Editor* • VIVIAN RYDEN, *Circulation Manager.*

VAC VERIFIED AUDIT CIRCULATION

Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 25c per copy (except special issues—40c). Subscription $4.00, 1-year; $6.50, 2-years; $8.50, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.



UNRESTRICTED RANGE OF VOLTAGE AND CURRENT RATINGS

- no routine maintenance
- light weight, portable
- mounts in any position
- not damaged by freezing
- non-corrosive
- obtainable in any size

Now available in all sizes, Lorain Dry CEMF Cells eliminate the maintenance problems associated with liquid-filled cells. Their light weight, portability, safety, and their unrestricted range of voltage and current ratings also adapt them for use as voltage regulating elements in many applications in which wet cells could not be used. They do not give off gases, do not employ liquids, are relatively insensitive to shock, and do not require maintenance or periodic attention. Lorain Dry CEMF Cells, therefore, can be installed wherever most convenient, making possible considerable economies in wiring, mounting racks, and floor space

Lorain Dry CEMF Cells are selenium covered metal plates, specially treated so their internal resistance decreases rapidly as the current flow through them increases, making them effective as voltage regulators. The amount of voltage drop is determined by the number of plates connected in series. Bulletin 176 lists representative sizes; assemblies to meet individual specifications are readily made to order. Specific recommendations will be made upon receipt of the current and voltage limits to be met, and the preferred mounting arrangement.

POWER EQUIPMENT FOR COMMUNICATIONS AND INDUSTRY

our equipment is sold through leading telephone distributors

FLOTROL SUB-CYCLE

LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

THEY'VE SEEN A WALL PHONE

THEY WANT ONE

YOU CAN GIVE

KELLOGG
A DIVISION OF I T & T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation
6650 S. Cicero Ave., Chicago 38, Ill.
Telephone: POrtsmouth 7-6900

KELLOGG Warehouses and Offices:

5924 S. Pulaski Road
Chicago 29, Illinois
REliance 5-7740
TWX: CG-3296

4501 Truman Road
Kansas City 1, Missouri
HUmboldt 3-7085
TWX: KC-686

6100 Excelsior Blvd.
Minneapolis 16, Minn.
WEst 9-6715-6
TWX: MP-1195

1515 Turtle Creek Blvd.
Dallas 7, Texas
RIverside 7-5191
TWX: DL-02

165 Prospect Street
Passaic, New Jersey
PRescott 9-3610
TWX: PAS-1067

23 Broderick Road
Burlingame, California
OXford 7-5780
TWX: SAN MATEO-06

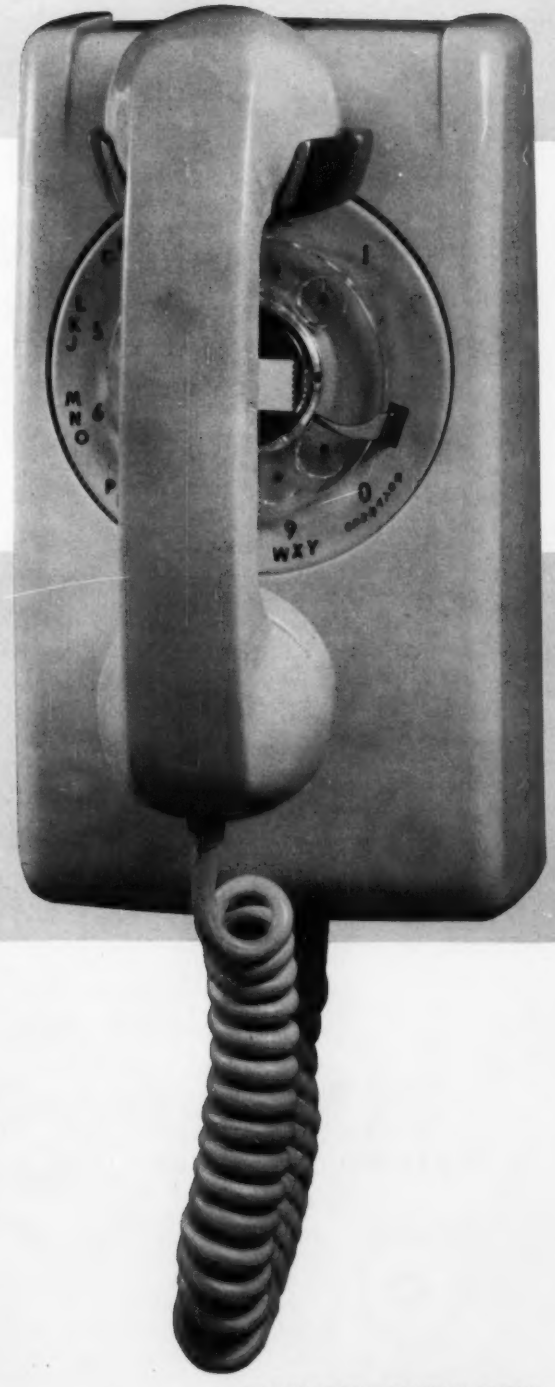
1555 West Fourth Street
Mansfield, Ohio
LAfayette 4-6511
TWX: MANS-O-132

1594 Southland Circle, N.W.
Atlanta, Georgia
Sycamore 4-2441
TWX: AT-351

IN THEIR FAVORITE MAGAZINES,

JUST LIKE IT...

IT TO THEM



Your customers have been seeing an attractive new wall telephone in their favorite magazines. They have seen it in color ads, and in picture stories about kitchens and recreation rooms. That familiar, neat design is what your customers have in mind when they order a wall phone.

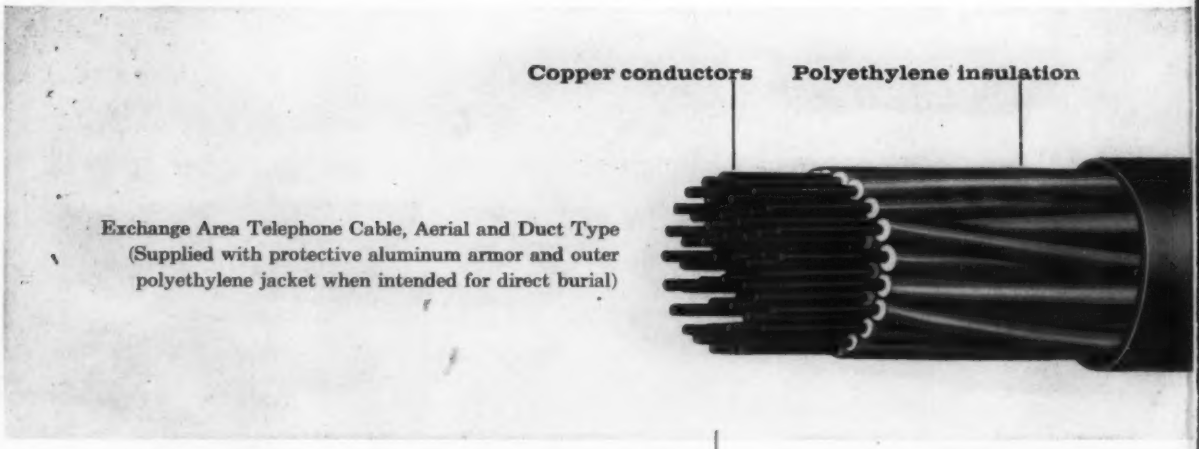
And now you don't have to sell them a different design . . . you can give them exactly what they want, the Kellogg K-500. It is available to you for immediate delivery in 8 decorator colors.

THE KELLOGG K-500 WALL PHONE IS AVAILABLE IN 8 COLORS

MEET A NEW MEMBER OF A FAMOUS

PHELPS DODGE THERMOPLASTIC EXCHANGE AREA TELEPHONE CABLE

FOR AERIAL, DUCT AND DIRECT BURIAL USES



Exchange Area Telephone Cable, Aerial and Duct Type
(Supplied with protective aluminum armor and outer polyethylene jacket when intended for direct burial)

The controlled craftsmanship and quality of Exchange Area telephone cable are typical of the entire line of Phelps Dodge thermoplastic telephone wires and cables including:

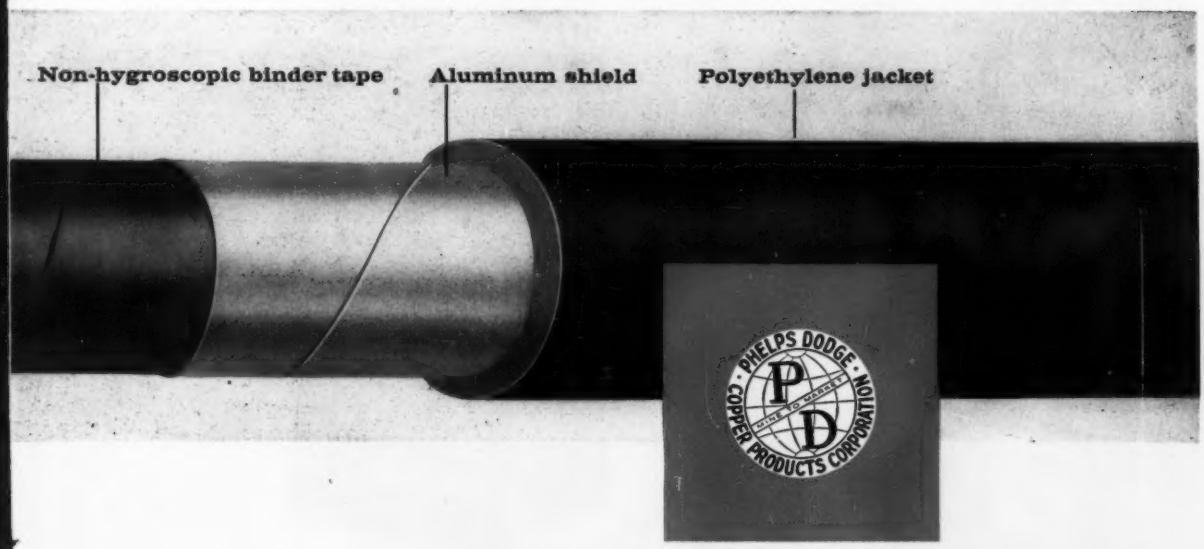
Self-supporting telephone cable
Rural distribution telephone wire
Urban distribution telephone wire
Inside wiring telephone cable

"FIRST FOR LASTING QUALITY—FROM MINE TO MARKET"

"MINE-TO-MARKET" LINE...

- Soft annealed copper conductors of highest grade copper from Phelps Dodge's own open pit mines.
- Highest quality polyethylene compounds for insulation and jackets assured by top grade materials and Phelps Dodge's vast experience in the plastic wire and cable field.
- Unique "lay pattern" that virtually engineers cross talk right out of the cable.
- Electrically continuous aluminum shielding tape.
- Special non-hygroscopic binder tape of laminated rubber and Mylar* that provides superior dielectric strength between core and shield, extra mechanical protection to the cabled assembly.

**Mylar—Du Pont's polyester film.*



PHELPS DODGE COPPER PRODUCTS CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Fort Wayne, Greensboro, N. C., Houston, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Washington, D. C.

interested in growth

Look how toll revenue is growing!

Like the little guy in short pants who suddenly towers over you and wants to know if he can use the car tonight, toll revenue by Independents has grown so big so fast it's almost unbelievable.

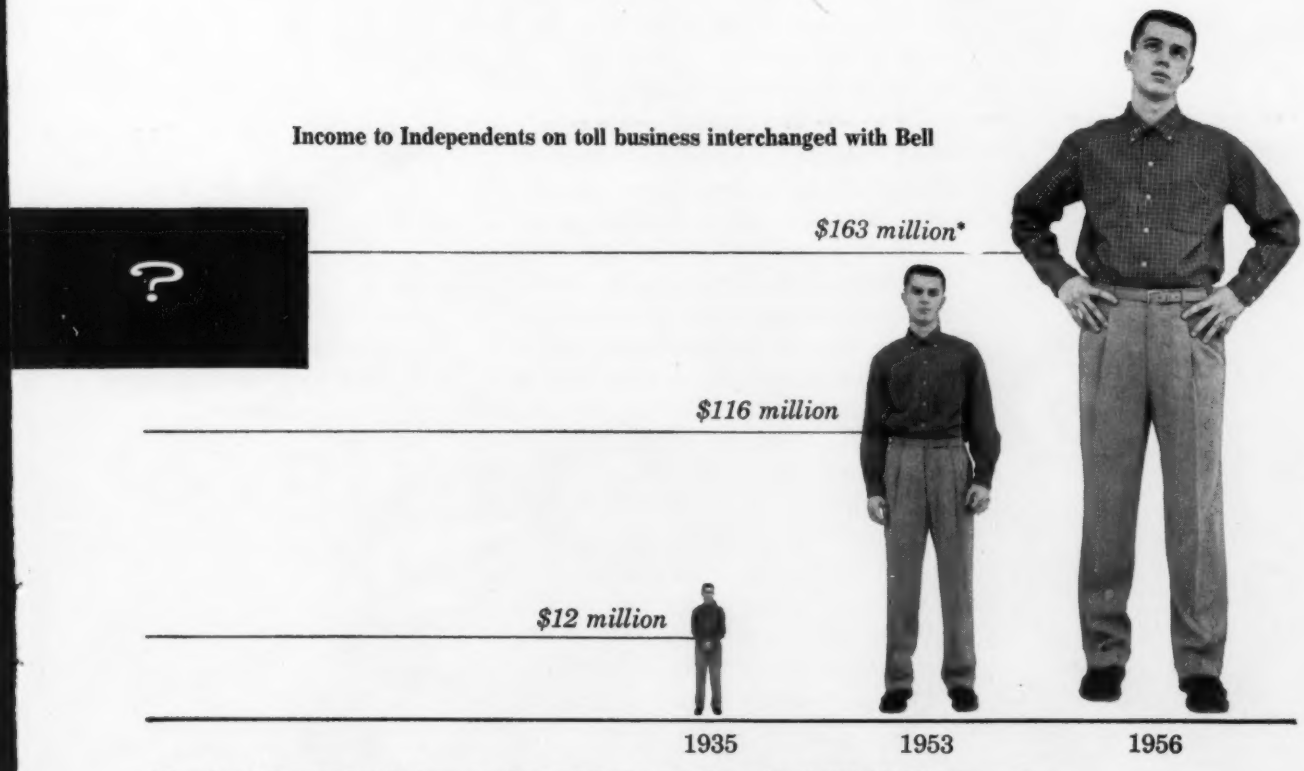
QUESTION: *Are you getting your full share of this mounting pile of toll dollars?*

If not, a suggestion . . . let Automatic Electric's carrier and radio engineers help you now in developing your toll circuits, TWX installations, telemetering and other special services that build toll revenue. Our specialists are ready and eager to go to work for you.

Just drop us a line today.

Automatic Electric Sales Corporation,
Northlake, Illinois,
FIllmore 5-7111.

IN CANADA Automatic Electric Sales (Canada) Ltd.,
Toronto, Ontario.
Offices in principal cities.



*Based on "Report of Toll Compensation and Settlements Committee" 59th USITA Convention.

AUTOMATIC ELECTRIC

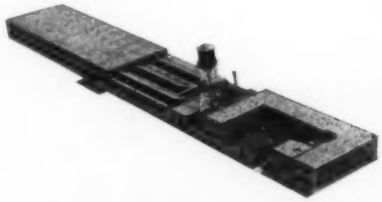
A member of the General Telephone System –
One of America's great communications systems

GENERAL TELEPHONE SYSTEM

SINGLE SOURCE buying is

(ask your wife)

Years ago, folks had to shop at a number of stores to fulfill all their needs. Today, the modern supermarket and shopping center has made it possible to buy from a single source. Telephone folks too, have found that single source buying saves them more time and money than before. It also makes for greater efficiency in operating their company. Whatever your needs may be—tools, hardware, protection equipment, aluminum telephone booths, insulated wire, etc.—Leich can serve as your single source for all supplies and materials. When you buy from us, you can rest assured that every item has passed a rigid test to prove its merit and every new product has been carefully investigated. You can also depend on Leich as the source to give you fast, prompt service on every order. Next time you order supplies, use the *single source* that will offer you the most for your supply dollar . . . LEICH.



EVERYTHING YOU NEED YOU CAN OBTAIN FROM LEICH

LEICH

A MEMBER OF THE GENERAL TELEPHONE SYSTEM — ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

better...

LEICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

PACIFIC COAST: 11401 WEST PICO BLVD., LOS ANGELES 64, CAL.: SOUTHWEST: 1227 SLOCUM ST., DALLAS 7, TEX.: SOUTHEAST: 5126 SOUTH LOIS ST. TAMPA 11, FLA.

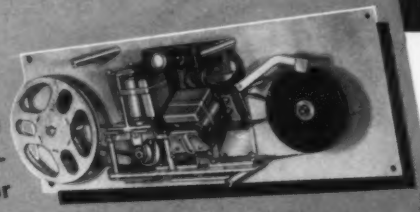
manufacturers of telephones, switchboards and related apparatus since 1907

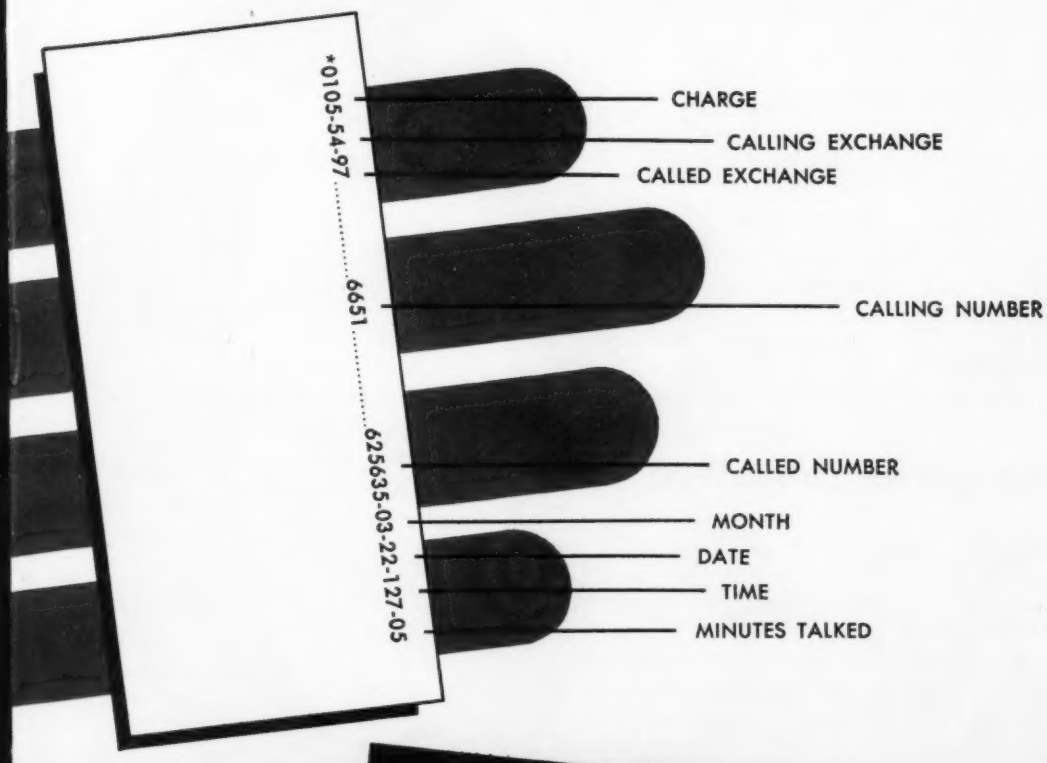
NORTH AuTollizer PRODUCED THIS TICKET *Automatically*

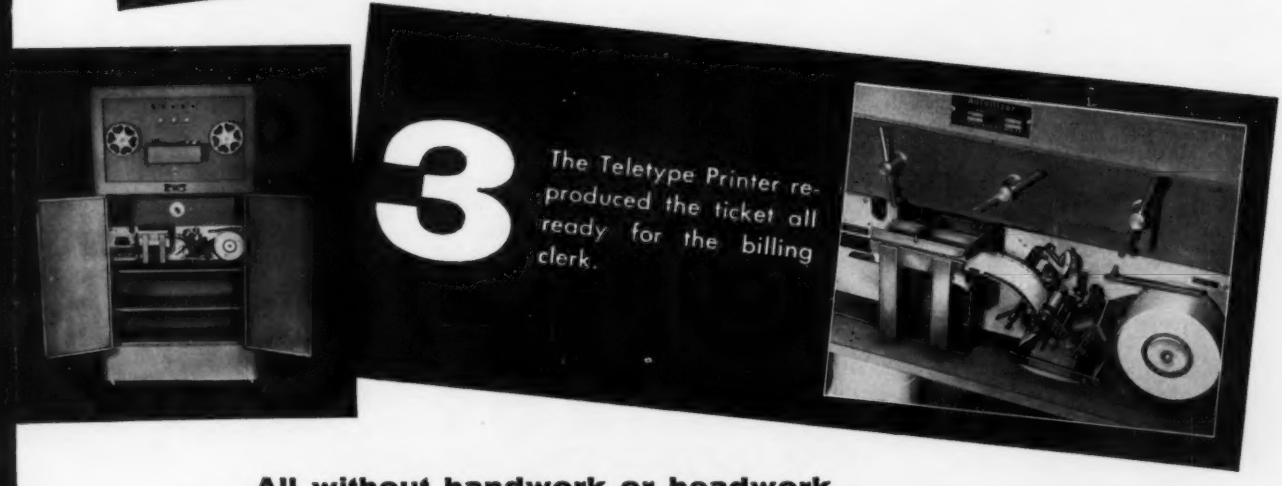
SIMPLE AS 1-2-3

2 The NORTH Analyzer "read" the punched record and computed the cost from the proper preset base and overtime rates.

1 The NORTH Recorder made a perforated tape record of all the information necessary for billing the call.







All without handwork or headwork

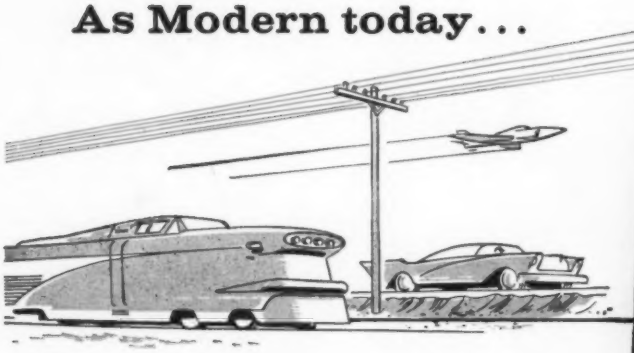
The savings in labor are obvious—this steady night and day flow of **unsupervised** toll business becomes profitable with

NORTH AuTollizer®

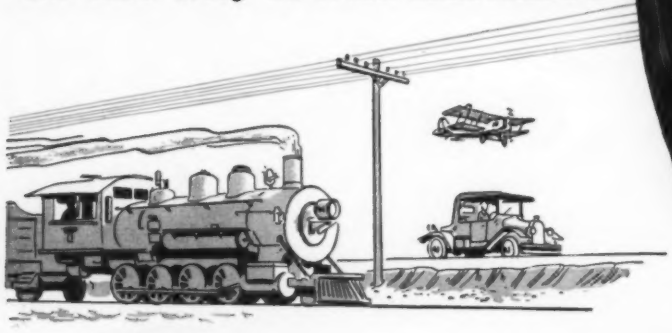
NORTH ELECTRIC COMPANY

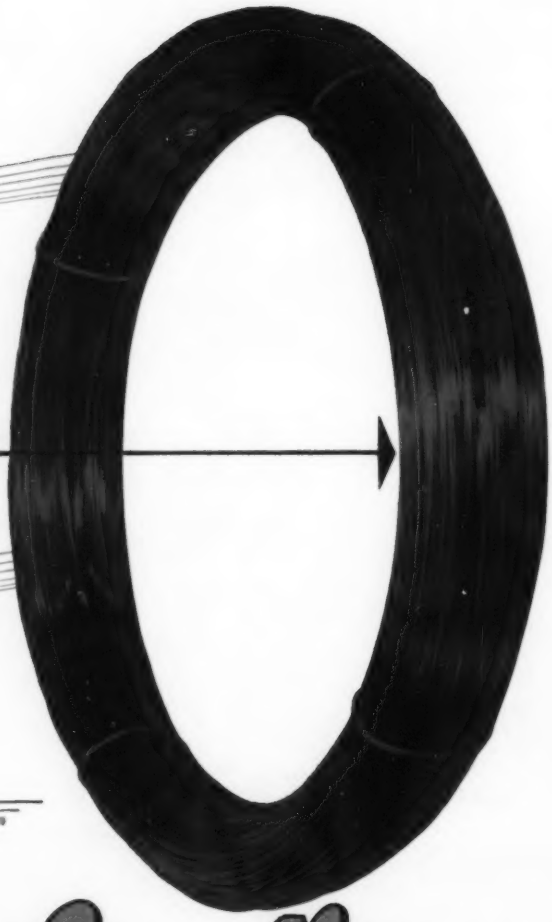
601 SOUTH MARKET STREET • GALION, OHIO

As Modern today...



as the day it was installed





Copperweld Line Wire

TRADE MARK

Here's a line wire that refuses to grow old! Copperweld* Lines strung decades ago are still giving top performance. This long service life is possible because Copperweld has an ageless copper covering to prevent corrosion. And the rugged steel core, protected by the copper, assures permanence even under the most severe weather conditions, and provides strength for long-span construction.

Not only proved in past performance, but designed to stay modern for the future, Copperweld Line Wire is the best engineered conductor for voice, carrier and signal circuits. Write today for your copy of the Copperweld Engineering Data Book.

*Trade Mark

SOLD BY LEADING DISTRIBUTORS

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION *Glassport, Pa.*
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

STRENGTH

PROVED IN SERVICE FOR OVER 40 YEARS

Editorial

Excise Taxes Must Be Removed

WHILE we have no desire to inject ourselves into the current Washington confusion created by the quest of anti-recession measures by both of our political parties, we do have one recommendation to make concerning the cutting of federal taxes — and that is that all federal excise taxes be substantially reduced or completely eliminated.

Early elimination of the present excise taxes should receive serious consideration by Congress for two basic reasons, regardless of whether or not a tax-cut is deemed necessary as an anti-recession measure.

The first reason is that they are fallacious and discriminatory, because, in the first place, any tax which singles out only a few commodities and services out of the hundreds purchased by the people, cannot be anything but fallacious and discriminatory. The fallaciousness and discrimination of such a tax can be overlooked and condoned in wartime and in other emergencies, but they should not be continued during so-called normal times.

This leads us to the second basic reason for the repeal of the excises. There is grave danger that these taxes will become imbedded as a part of the permanent federal tax structure. When Congress enacted the excises it did not intend this to happen. As a matter of fact, some of the laws, creating and increasing the taxes, specified termination dates. As revenues from this source increase, future Congresses will be more reluctant to remove the taxes. Early repeal will eliminate the possibility that the excises will become a permanent fixture in our tax structure. The present Congress has an obligation to remove this possibility.

There is another reason why Congress could consider the immediate removal of the excise taxes. It is not a basic reason, but purely a personal and political one. In election years, many politicians, in both parties, always strive to win the affection of voters and one of their most popular appeals is a promise or proposal to reduce taxes. If our legislators really want to influence and win voters this year, we can think of no better way to do it than to repeal the unpopular excise taxes.

Congress has already lost much face with the people by continuing the high wartime emergency taxes for 12 years after the emergency was over, despite the fact the taxes were to revert to the lower prewar levels after World War II ended. The legislators can recapture some of the lost faith and confidence of the people by taking immediate action to remove the excises, even at this late date.

Then, too, if Congress wants to consider a tax reduction as a means to overcome the recession by increasing consumer spending, the elimination of excise taxes would put sizable amounts of spendable money in the pockets of all American families.

Perhaps, Congressmen may feel it is not feasible to eliminate all the excise taxes at one time. But, there is nothing to stop them from starting and planning, this year, a long-overdue repeal of these taxes over a two or three-year period. This can be done by eliminating the taxes being imposed on the absolutely essential products and services and reducing the other excises this year, followed by a complete repeal of all the remaining taxes over the next two years.

In initiating such a program, there is no better place to start the repeal action this year, than with the elimination of the burdensome taxes on communications services, as they are the most unfair and discriminatory of all the excises. They are the most unfair because excise taxes in general are imposed mainly on so-called luxuries, ***and communications service is not a luxury but an absolute necessity in the present-day***

business and personal lives of all Americans; they are the most discriminatory because communications is *the only essential everyday household and business utility service so taxed.*

It also is logical that the repeal of communications taxes should have priority because they were one of the very first of the excise taxes to be imposed, having originally been levied in 1918. Therefore, telephone subscribers really "have had it" when it comes to paying these so-called "emergency" taxes.

The Gallup Poll recently found that the communications tax is the most unpopular of all excise taxes for the self-evident (apparently not to Congress) reason that it adds to the cost of a genuine necessity.

An orderly repeal and reduction of the excise taxes, say over three years, would not put any more, if as much, strain on the government's financial status than some of the loosely-drawn, complicated and hodge-podge tax-cutting (or public works spending) proposals presently advocated by some of our political leaders.

Let's see how such a plan could work out.

For the fiscal year, ending June 30, 1957, the government received 10.5 billion dollars from all excise taxes. Of this amount, 613 million dollars came from the taxes on communications services (incidentally, of the 613 million dollars, 347 million were paid on local service and 266 million on long distance service).

Complete elimination of the excises on communications services would reduce the government's excise tax income to $9,887,000,000. An accompanying reduction of 50 per cent in the remaining excise tax rates would amount to $4,943,500,000. This would mean that the people would enjoy a tax reduction of $5,556,500,000, still giving the government $4,943,500,000 income from excise taxes.

Of course, as in the case of any tax cut, the government would not lose all the revenue resulting from this elimination and reduction of excise taxes, as it would benefit, from increased corporation taxes, brought about by the additional consumer spending of the more than 5.5 billion dollars.

In regard to the excise taxes on communications, themselves, the loss to the treasury from the repeal of these taxes would not be so great as appears on the surface. It should be remembered that a large portion of the tax finds its way into business expense accounts, thus becoming a deduction from income for tax purposes. With the corporation income tax rate at 52 per cent, it is apparent that less than one-half of the excise tax paid by corporations would be lost by repeal.

Congress has had plenty of support for such a program through the demands for the repeal of the communications excise taxes from telephone companies and Western Union, their subscribers, and such organizations as state utility regulatory commissions, national and local chambers of commerce, and REA-financed telephone cooperatives.

Congress could put an orderly excise elimination and reduction program into motion immediately by amending and passing a bill (HR 10061) introduced by Rep. Noah M. Mason of Illinois, on Jan. 16, to abolish the excise taxes on communications services.

We think that Congress should be further encouraged to do something about these taxes NOW. All telephone companies and their employes should immediately telephone, telegraph, or write their congressmen and express their views as to the need for and logic of the repeal of the communications excise taxes. Also, they are urged to again ask their subscribers, the general public, and local civic organizations to write or contact their senators and representatives on this important issue.

• • •

"Taxes on train travel and other forms of transportation and communications, such as telephones, were imposed or raised during World War II to discourage unnecessary use of vital facilities. . . . Telephone service is the only household utility subject to federal taxes. In hard times, such as we are going through, it is certainly unfair to add to already high prices of necessities through a high excise tax."—*Chicago Daily Sun-Times.*

Mister Dooley on the Tillyphone!

A St. Patrick's Day fantasy in which the wisdom of a fictitious philosopher of a half-century ago is applied to a present-day problem—protecting the secrecy of telephone service and other private communications. Are we approaching the day when the scrambling device will be more important than the telephone call?

By FRANCIS X. WELCH

FINLEY Peter Dunne died in 1936. He was the creator of that satirical genius, Mr. Dooley, which appeared in the columns of the old Chicago *Journal* and other newspapers around the turn of the century. Fifty years ago every music hall in the United States was echoing to the tune of a popular song "Mister Dooley (the Greatest Man the Country Ever Knew!)." Earlier this month, on St. Patrick's Day, this writer was spending the day in pleasant reminiscence with an old volume of Dunne's columns. Suddenly in bemused fashion, your correspondent began to wonder what Mr. Dooley would say about some of the things that are happening in Washington today, about the Federal Communications Commission scandals, and the wire taps and tape recorders, and other peculiarities of our time.

And, so in mind's eye, this writer was taken back to Dooley's tavern, that famous place on "Archery Road," where Dooley used to polish glasses and look out the window at the Chicago horsecars and discuss the mysteries of life with the wit and learning of a philosopher. And, there, too, was his faithful straight man, the simple-minded Hennessy, who lapped up the words of wisdom and anything else in front of him. Put yourself in the mood and maybe you can hear "Misther Dooley's" voice from the past, discussing a present-day problem of great interest and concern to the telephone industry.

"Well, Hennessy, Oi see be the paypers that foine broth of a bhoy, Jack Porter, hez dun it agin'."

"And what hez he dun, Dooley?"

"He hez put his foot in it. That's what he hez dun. And being a thrue son av Texas, he hez a very big foot. And he hez put it into somethin' very big. He hez pretty nearly killed off ahl his Texas millionaire oil and gas friends with the kindness av his heart. He hez a big heart, Jack hez, as nobudy will deny. He wrote a liter to about everybudy in Texas with more thin a half-million in the bank. This wud be about the populashun av Evanston on a foine day. And, in this liter, Hennessy, good auld Jack Porter, promised every Raypooblican vote in the House av Represintatives which Joe Martin could beg, borrow, steal, or persuade with a shillelagh. Provided av course ahl these foine Texas Bhoys would come to a grand dinnir fer Joe Martin (with a little change in their pockets fer a good-will offerin', ye understand). This dinnir wuz held at the Shamrock Hotel in Houston—that fabulous castle av a place which wuz built by that other fabulous Texas bhoy, Glen McCarthy. Twas a grand affair. They're still talking about it from Pecos to the Gulf."

"And did they ahl come, Dooley?"

"That they did, Hennessy, to a grand tune av a hundred thousand dollars, at a hundred dollars a plate! They brought their wives and their chilthren and their cuzzins, and ahl their shirt-tail relayshuns, and even their mither-in-laws!"

"Mither-in-laws at a hundred dollars a plate! Dooley, I don't belave it!"

"Yer have to ate th' grand cookin' av Texas to appreciate that one, Hennessy. Anyway, when th' news got aboot that th' damnyankee Raypooblicans were supposed to vote fer th' Texas gas bill in Congress, th' fat wuz in the fire. Joe Martin wuz fit to be tied. He ups and sez that fer ahl av him, Jack Porter could plaze take his dhirty money back and keep it. And so did ahl the other ungrateful damnyankee Raypooblicans. They said their votes in Congress were not to be bought—not with that kind av money, inyhow. Which goes to show, Hennessy, that those pore Texans should niver hev dayserted th' faith av their fathers—politically speaking—fer which so many brave Dimmycrats bled and died at th' Alamo. And so auld Jack Porter's big Texas heart was broken—what with ahl that money on his hands, and him not knowin' whativer to do with it ahl."

"How did th' damnyankees find out about this dinner at th' Shamrock, Dooley?"

"Wurrah, that's th' thing that's been botherin' me all day, Hennessy, till me head is sore and weary. It's an evil time we live in that there's no more such a thing as a private, confidential communicayshun, man-to-man, so to speak. There was no way fer Jack Porter to get in touch, privately ye mind, with a couple av thousand av his Texas friends. Whether ye write or tillyphone or sind a wire, or even speak in the grand old Gaelic tongue, there shure to be a little divil av a newspaper reporter hidin' behind a chir, takin it all in. Talk av a 'summit conference,' bah! President Eisenhower and the Queen's bhoy, Macmillan, and this Russian blackguard, Krewschef, could ahl go down into the deepest dungin av Fort Knox, and lock ahl th' doors, and give sthrict orders to shoot inybudy else approaching within a hundred yards. And what would happen?"

"What wud happen, Dooley?"

"Why, there wud be that fellow Spew Peason sittin' right on th' table, disguised as an ash tray, takin' down

ivery word fer direct quotation in tomorrow mornin's *Thribune*."

"Tis a sad state av affairs," said Hennessy, gulping down his drink. "But wudn't yer think if a budy kept his wits, he'd see to it there wuz no such nosy blabbermouths lurkin' about?"

"Ye don't know th' half av it, Hennessy, th' nasty thricks and dhirty dingbats which can be used to peep and pry into th' mind and soul av an innocent man! And that goes double fer a guilty one! Do ye mind what happened to that young fellow they got off av the Fideral Communicayshuns Commission, a while back? Do ye know what happended to him?"

"What happened, Dooley?"

"Well, here's this nice young fellow, Dick Mack his name wuz, sittin' in his foine office at the FCC one day; and who should come thru th' door but this big lunk av an ugly kindly slob with a brief case. 'I want to ask ye a few questions. Commissioner,' sez he! 'Ask away, me bhoy,' sez Dick Mack, feelin' no pain. 'Oi'm only too happy to talk to inybudy at ahl, about inything at ahl, friend or fore, day or night, Dickie Mack's door is always open, ez inybody in Floridy can tell yer!'"

"Well, to make a short story av it, this big lunk av a lad sets hisself down and puts his brief case under th' desk. 'Dickie, me bhoy,' he sez, 'just between us girrls, giv us the low-down on ahl this to-do about a TV stayshun fer Miami? Oi thried to read about it in the paypers and get it thru me thick head; but Oi'm a counthry bhoy and Oi just don't pick up things easy like.' So, Misther Mack sez to hisself 'what harm talkin' to this pore unsettled creathure? Sure, he wudn't remember a thing wunst he's left the room.' So, Misther Mack tells him ahl about this, and ahl about that, loike he wuz talkin, to a riverint father confessor—never draymin,' mind ye, that ahl the while the rogue had an infernal machine, a-clickin' away in his brief case under th' desk!"

"An infernal machine," gasped Hennessy. "What wuz the man about? Wuz he daft? Wuz he thryin' to blow up Misther Mack's office?"

"As daft as a fox," said Dooley. "Blow up the Commissioner's office, he did—sky high—but not the way ye mean, Hennessy. This infernal machine wuz a bit av a thing no bigger thin yer fist. It hez a spool av tape on it which spins away loike a phonygraft. So ye can imagine the chagrin av pore Misther Mack when he finds that ivery blessed word he's uthered, for a half-hour, haz been taken down as sweet and as thrue as yer Sunday raydio brings yer the New York Sympathy Orchestry playin' th' first movement from not payin' th' rent."

"Saints presairve us," exclaimed Hennessy, "tis a divilthry!"

"Divilthry is it? Oi tell ye there tis no place safe inywhere on earth from th' cute little bugs and baubles they can now hide. They can put them in yer hat or in yer tillyphone or in yer chandrelier or even in yer best girrl's hair when ye start tellin' her how much yer afther lovin' her and can't wait to be wed."

"Wire tappin' is it?" asked Hennessy. "Oi thought that wuz agin' the law."

"Agin' the law it is," snorted Dooley, "but th' ownly people they enforce th' law agin' is the poleece; and it is the poleece which cud use th' wire taps and such loike to th' best advantage—trappin' the murtherers and the theeves. But as inybudy except th' Suprame Court knows, it's th' murtherers and theeves which use the taps fer their own purposes; and it's th' poleece which cannot use them. No self-respectin' gangsther wud think av operatin' today, without his own tecknickle expert or raydio staff in charge av findin' out iverybudy else's business—including the poleece. It's th' modern style, so to speak, av gangsther organizations."

"Hah, Dooley, that's rich," said Hennessy. "The gangathers can use th' taps on the cops; but th' cops cannot use th' taps on th' gangsthers."

"That's about the size av it, Hennessy, except they don't even use wire taps inymore. That's as old-fashioned as th' 'beep-beep-beep' signal which th' Fideral Communicayshuns Commission sez ye must use wheniver yer record a tillyphone conversayshun. And as yer know, the only place th' 'beep-beep-beep' signal is used is where it creates th' graytest public nuisance—on th' raydio and tillyvision broadcasts."

"An' what are they after usin' instead av wire taps, now, Dooley?"

"Tis called an indoockshun coil, Hennessy. A bit av a dingus loike a giant fire cracker. An' when yer go to th' drugsthore to make a tillyphone call in th' pay stashun booth, there's this nice little auld lady who comes in afther ye. And she sits down bye the tillyphone booth and puts her knittin' bag next to it, an' orders a sarsaparilla to drink whilst yer tawkin' on the tillyphone. An' who is the nice little auld lady, but a gangsther in disguise with headphones under a wig. An' this thing in th' knittin' bag is takin' in ivery sound an' syllable which is uthered in that tillyphone booth! Ye might ez well be tawkin' over th' public address systhem av th' Union Stayshun!"

"Tis a shame an' a disgrace, Dooley. What is th' tillyphone comin' to, afther ahl?"

"Oi cannot tell yer that, Hennessy. Oi yewst to think that th' tillyphone wuz a foine thing, that it wuz here to stay. But, now, Oi dunno. Th' way things are goin' today, Oi think that th' good auld Doctor Alexander Graham Bell must be turnin' over in his grave loike a pinwheel! Oi think that if he cud come back and see th' way things are now, an' thin if he cud go back to that workshop in Boston, he'd hev a different tale to tell Misther Watson, his auld buddy. 'Stay where yer are, Misther Watson,' Dr. Bell wud say, 'Oi don't want yer helpin' invint any insthruments av th' divil. Let us instid take ahl these wires an' batteries and throw them into Boston Harbor, loike the good American pathriots did to the cursed British tay. If we do this, Misther Watson, maybe unborn ginerashuns will rise up and call us blessed!' That's what Dr. Bell wud say, Hennessy, if he had it ahl to do ahl over ag'in, Oi'm thinkin'."

"Don't ye belave there's iny future fer th' tillyphone, at ahl, at ahl, Dooley?"

"Not ez long ez its becomin' an insthrument av betrayal an' espionage, Hennessy. Maybe some day when we ahl can have our own tillyphone to wear on our person, loike a wrist watch, th' secrecy an' th' confidence av tillyphone communicayshun will be resthored. When that toime comes, iverybudy—bhoy or girrl aloike—will be gettin' a tillyphone number fer life, along with his baptism name. Thin maybe the human race will be freed from th' wire taps and th' bugs and th' snakes that are festerin' around th' tillyphone service av today!"

"But that wud mean, Dooley, that ahl tillyphone conversayshun wud have to fly thru th' air by raydio! How wud that improve th' secrecy av communicayshuns?"

"There's where yer are wrong, Hennessy. Yer see there's this other invenshun called a scrambler. An' it mixes up th' signals loike Eyetalyun speegatti, so they make no sinse at ahl to inyone except th' person fer whom it wuz intinded!"

"Well, now, that is a foine thing, Dooley. Maybe something good will come av th' tillyphone afther ahl."

"Oi'm hopeful that it will, Hennessy. An' th' day may come when that scrambling device may be just as important a birthday present fer th' new born babe as th' tillyphone number. An' th' scrambling may even become more important than th' tillyphone call itself!"

Design and Operation of Small Companies

By R. J. POLLOCK

Part 13
Training Personnel

AN EMPLOYE training program designed to cover the telephone operating field will differ considerably from those programs used in other types of industries. The fact that the telephone industry is a regulated business brings in factors which are not common to most other types of businesses. The new telephone employe might have all the earmarks of becoming a good lineman or trouble-shooter, but what about his general attitude toward the job and its effect on his company's public relations. Further, does he have the proper physical and mental make-up to advance beyond the job first assigned to him.

In the smaller telephone company it is not economical or practical to set up a training program which is apart from the normal day's telephone work, but if the "do's and don'ts" are incorporated within the normal daily routine the results obtained will, in many cases, produce the all-around telephone man whom we frequently meet in the Independent operating field.

Many of you have at one time or other marveled at a small exchange manager's expert handling of an irritated customer with a real or imaginary complaint. Basically, he used a procedure which could be called applied psychology, but actually it was the result of a clear understanding of customer thinking, along with a complete knowledge of the telephone operating picture.

Obviously, only certain types of persons will make good telephone employes and their impressions of the telephone operating field will, if determined at the time they are being interviewed for employment, go a long way in ascertaining whether or not they can be converted into competent telephone people. Employes' attitude may be difficult to determine at this time, but whether or not they are willing to work at any and all hours will act as an indicator.

In some cases, an applicant will express dissatisfaction to working beyond regular hours if the question is brought up during the interview because he has not had the opportunity to consider the problems encountered in the telephone field. Under normal conditions an attitude of this kind would suggest that the applicant be rejected, but in reality this is the start of the training program. It is a simple matter to explain to him that the services of the power company troubleman are required if the kitchen stove goes out of service during the preparation of the Sunday noon meal, but the telephone counterpart might not be so readily understood.

If, on the other hand, the slightest objection is noted in the applicant's attitude to supplying this necessary holiday overtime, both parties can save considerable time by terminating the interview immediately.

In many instances, and especially during periods when economic conditions are below standard, telephone companies will receive a considerable number of employment applications, not because the applicants wish to enter the telephone field, but because they must secure jobs for security reasons. While employment fluctuations are not as evident in the telephone field as in some others, this should not prevent telephone companies from securing from these applicants, persons of high caliber.

Appearance, neatness and a generally friendly manner may not be a prerequisite for an apprentice lineman or cable splicer's helper, but what will the individual's job in the company be five years hence? If he has any contact with the public at all, the company will be judged by his actions, since, in the eyes of the public, he is part of the company whether or not we consider him just an employe doing an ordinary job.

Whether or not the new employe will be a satisfied worker on any job assignment given to him will depend largely on the training and handling he has received from the immediate supervisor on his first assignment. Here it will be determined whether he will be a "five o'clock and pay-day" individual, or one who will put out extra effort to learn and understand the art of telephony.

It follows, then, that the training program could be expanded to cover not only the new employe, but those already on the payroll.

Whether or not this course is necessary can be determined by observing the appearance of the outside plant. If, at the end of any month in an exchange with a sufficient working force, there are a number of missing or floating insulators, loose wood brackets, broken poles, slack wires, dirty floors in the repair shop, messy looking pole yards, or unkept looking maintenance trucks, then it is very possible that a change is necessary from the top level of the supervisory force down to the bottom.

If a picture of this kind exists over a period of time, it cannot be expected that the paper work in connection with company records or other functions, such as customer relations, in the exchange are in any better condition.

The continual observance of employes and their habits will, on occasion, bring out another phase of human behavior which is difficult to understand, but nevertheless requires stern supervisory action in order that it does not get out of hand—that is, personal appearance and cleanliness, especially for those people who have direct contact with the customers in their homes. Here management can only assume that customer relations are being handled in a manner which is most beneficial to the company, since actual supervision is not possible except for a relatively minor number of cases.

The appearance of his clothes at the start and finish of a normal day will give some indication of the employe's habits as to cleanliness, and another check is the appearance of his personal car, compared to that of the company truck or car assigned to him. If the appearance of both automotive units is below that which would be expected for normal conditions, the employe should

not be assigned to jobs where customer contact is a daily occurrence, but on the other hand if his personal car reflects a spic and span appearance and that of his company unit represents a pile of mud on wheels, an attitude problem exists which requires immediate and positive action in order to plug a large hole in the bottom of the public relations basket.

Employe attitude, even in those persons whose duties require infrequent customer contact, should be of a high order. Call it company feeling if you wish, but his thinking will be reflected in friends and acquaintances both on and off the job and it will have a bearing, be it ever so small, on the operational picture which will be in evidence in the ball of string, figuratively speaking, which goes to make up any telephone company.

The telephone employe who has direct contact with customers at their homes should, in addition to his personal appearance, have a pleasant personality. This may be the installer or the station maintenance man, but in either case he is the telephone company as far as the great majority of customers are concerned. He is the only contact many of the customers have with the company since many bills are paid by mail, or to a girl in the front office, and, therefore, his actions and conduct will have a direct bearing on public relations.

It should be evident from the above that we cannot place any and all individuals in the various jobs in the telephone field if we intend to maintain a good operating picture. In other words, we cannot just count heads and place a man in a job due to seniority, or for some other reason, without first considering all of his qualifications, be they good or bad. If we approach the situation in a manner similar to our education systems, whereby a student cannot take a course unless he has prerequisites which have been set up as necessary qualifications for further study, we will be on the right track toward ideal company operations.

Unfortunately, many smaller companies have placed individuals in jobs for which they do not have the proper qualifications and training and about the only reason these companies get away with it is because they cannot place an actual dollar value on public relations, so the results in such a case as this cannot be definitely determined.

There are, however, many ways in which the condition shows up as a direct cost item and can be seen by the most casual observer. Poor workmanship being paid for at the going hourly rate and carelessness in the use of tools, power and automotive equipment, will usually result in higher maintenance and replacement costs. The cost covering the loss of small insignificant items, such as wire sleeves and wood screws, would, if it could be accurately determined, result in an astounding annual figure.

The condition can be illustrated by comparing the actual cost per mile of two maintenance trucks driven by two different individuals. Each may be performing the same caliber of telephone work and are receiving the same wage, but the maintenance cost of the truck driven by one of the men can be double that of the truck driven by the other.

It would also be enlightening to determine the the amount of small new and usable telephone material which collects on the ground especially below a terminal pole or, for that matter, in the family laundry room where the pockets in working clothes are emptied before entering the washing machine.

Numerous plans and programs have been set up to train employes covering the installation of telephones, shooting trouble or stringing wire but, as stated in previous articles in this series, a public education program far in excess of that currently in effect would be very beneficial to the industry as a whole.

In this writer's opinion, the two most influential ambassadors we have for this job are the station installer and the repairman. These jobs place the customer and the company representative on a basic level which has no equal at any other operational job.

It is true that in the case of the installer some other company representative might have made the original contact and have sold the service he is to install. However, in the eyes of the customer the installer is there to perform a routine function and, therefore, has no ax to grind, which puts them on a level that can be compared to the student-teacher relationship.

Here the customer, not having had previous service will, if encouraged, ask numerous questions which can be answered properly only if the installer has the ability and knowledge to answer them, in addition to the know-how to install a telephone.

In the case of the trouble shooter, his customer contacts will be quite different and will deal generally with subscriber complaints, and, in many cases, they will be brought to his attention whether he encourages it or not. Much has been done to train installers and trouble shooters to sell additional service and other revenue producing items, but what about training them to deal with customers' questions and statements about the policies of the telephone company and operations of the telephone business.

We believe that all companies, particularly the smaller ones, should prepare their employes to answer and correct any questions or mistaken opinions that customers might have about the policies or characteristics of the telephone business. In training employes along these lines, many misunderstandings which cloud customers' thinking, and which are passed on by word-of-mouth to others, will be corrected, improving customer and public relations immeasurably. It also will tend to "insulate" the public's mind from the many unfounded and misleading statements made by anti-utility politicians.

Perhaps some managements might think that such an educational program would not be advisable because of the non-productive time involved, especially in a small exchange. Actually, no additional time would be spent, since some unproductive time always exists, and a good program would merely convert it to a productive basis.

It is also conceivable, and no doubt it would come up, that the plant men performing this educational work would demand additional remuneration for the work based on the fact that it is an additional skill which they possess. It could be termed as one of the job requirements but, on the other hand, if the employe who is highly successful in performing the educational job is suitably rewarded, it would serve as an incentive to others to do a similar job in a phase of work which is appreciably neglected in today's operating picture.

Any employe training program which did not include safety, good working habits, and the correct use of tools would not have a very long life in our present business world. It should also cover conditions that directly affect the employe, such as advancement possibilities, health and sickness benefits, vacation allowances and any other conditions which have a direct bearing on the employe's well being, and, if possible, meritorious service should receive a just reward since it will have a magnified effect on employe attitude and production.

A complete story of the company operations is a necessity for any new employe, and should cover the routine operations which are in effect in all branches in addition to the plant, financial and regulatory aspects. It

(Please turn to page 48)

Economic Selection Studies

By JOHN D. DRESSER

Part 4

4. 000 ECONOMIC SELECTION STUDIES. 4.100 *Economic Selection Studies* consist of comparisons of two or more plans on an economic basis. These comparisons are made between the annual costs, plus non-recurring expenses converted into equivalent annual amounts, of each of the various plans submitted for study.

When a project appears necessary, there may be a number of ways by which the job may be done. These different plans are reduced to a minimum number by discarding those which experience tells would not be economical or desirable. Those remaining are then tested for their relative economy.

Analysis and consideration of first costs and of annual charges on different types and amounts of equipment under each plan retained for testing are required. Items which appear in *every plan* of a study in exactly the same type and amount and for the same period are known as "common" items, and are omitted from the study.

Economic selection studies must not be confused in any way with accounting or bookkeeping. The bookkeeper is concerned to a large extent with money after it is spent. Economic selection studies deal with money before it is spent. They are a factor in attempting to discover how to spend it to the best advantage.

Possible Ways By Which Charges Can Appear In A Study

Case	Item	Beginning of Period. 0	End of Period. "n" Years
Investment Items			
1.	A.C. of existing plant removed at beginning of study period	LSD Factor 1	
2.	A.C. of existing plant retained for part of study period	A.C. Table II / LSD Table 8	
3.	A.C. of existing plant removed at end of study period	A.C. Table II	LSD Table 8
4.	A.C. of existing plant retained beyond period of study	A.C. (including ann. dep.) Table II →	
5.	A.C. of proposed plant retained for part of study period	A.C. Table II / LSD Table 8	
6.	A.C. of proposed plant removed at end of study period	A.C. Table II	LSD Table 8
7.	A.C. of proposed plant retained beyond period of study	A.C. (including ann. dep.) Table II →	
8.	A.C. of deferred plant removed within the study period	A.C. Table II, deferred / LSD Table 8	
9.	A.C. of deferred plant removed at end of study period	A.C. Table II, deferred	LSD Table 8
10.	A.C. of deferred plant retained beyond period of study	A.C. (including ann. dep.) Table II, deferred →	
Expense Items			
1.	Non-recurring expense at beginning of study period	Factor 1	
2.	Non-recurring expense during study period	Table 8	
3.	Non-recurring expense at end of study period		Table 8

Table 13

("Economic Selection Studies" by John D. Dresser was copyrighted in 1957. No part may be reprinted without credit, and then only by permission of the author or the Michigan Bell Telephone Co., Detroit, Mich.)

It must be understood that economic selection studies indicate or select *the most economical plan* of a number of plans being studied. These studies will not show what profit can be expected. Perhaps none of the plans will produce a profit to the company. Such an indication is not within the intention of an economic selection study.

4.110 There are two types of economic selection studies. *Present Worth Studies* compare the amounts of money required now by the various plans in order to meet all expenses or charges each year for a period of years in the future. The annual charges for each year covered by the study period are discounted back to the present time, or "zero date," and then accumulated into one total of discounted annual charges for each plan of the study. This is accomplished by multipliers obtained from the tables discussed earlier in paragraph 3.000.

Although there are other methods of making present worth studies, the depreciation method to be outlined is considered the most straight-forward, the easiest to understand, and is applicable to all conditions requiring this type of study.

Cross-section Studies compare the amounts of money required to defray all the charges of the plans for any one representative (or average) year. Both types of study use annuity and lump sum depreciation. Neither of them use straight line depreciation.

As stated above, the plans of present worth studies must be compared on the basis of the respective amounts of money required *now* to pay the expenses or charges for a period of years in the future, with the help of compound interest.

One of these expenses is the federal income tax. The income tax on each individual item of plant is used, as no gross or net income is involved in this type of study for comparative purposes. These income tax rates are determined by application of the method outlined in the paragraph 2.324.

In cross-section studies, however, the plans are often of such a nature that net income is said to be involved. Sometimes, the plan having the smallest annual charges may require more capital to build than some other plan. The problem then becomes one of determining whether the saving in annual charges is sufficient to make it worth while spending the additional money to build the plan.

In determining the return on this additional net capital required, cognizance must be taken of the cost of money, net salvage, and federal income taxes, as well as other items contributing to the annual expenses of the various plans.

In these studies, the difference in annual charges represents income not spent by building the plan having the smallest annual charges. Since it is essentially income, the difference is, therefore, subject to the full 52 per cent federal income tax. In determining the annual charges in this type of study, the federal income tax components are omitted from the individual types of plant.

These methods of treatment for federal income tax are illustrated in examples of the two types of economic selection studies found in paragraphs 6.600 and 7.700, which will follow.

Present worth studies are detailed beginning with paragraph 6.000. Cross-section studies are explained in paragraph 7.000 and those following.

ITEM	INVESTMENT	ANNUAL CHARGES		PRESENT WORTH			
		PER CENT	AMOUNT	PERIOD	FACTOR	TABLE	AMOUNT
Equipment	1,200	23.36	280	10	7.024	11	1,967
TOTAL							1,967
EQUATED ANNUAL CHARGE			280				

	ANNUAL CHARGE PERCENTAGES						
TYPE OF PLANT	Equipt.						
C OF M	7.00						
PROPERTY TAX	1.83						
INCOME TAX	4.95						
DEPRECIATION	3.28						
MAINTENANCE	6.30						
TOTAL %	23.36						

Table 15

ECONOMIC SELECTION STUDY
DATA SHEET

FILE NO. _____
MADE BY _____
DATE _____ 19 ____

NAME OF STUDY _____

PLAN NO. _____ PERIOD OF STUDY _____

DESCRIPTION OF PLAN _____

ITEM	INVESTMENT	ANNUAL CHARGES		PRESENT WORTH			
		PER CENT	AMOUNT	PERIOD	FACTOR	TABLE	AMOUNT
2000' aerial cable	1st cost	total %	1st cost				factor x
53 poles	1st cost	from	x %	3-10		11	ann. chges
		below					
aer. cable LSD 3200				7		8	
reloc. frames 2000				now		8	
TOTAL							
EQUATED ANNUAL CHARGE							

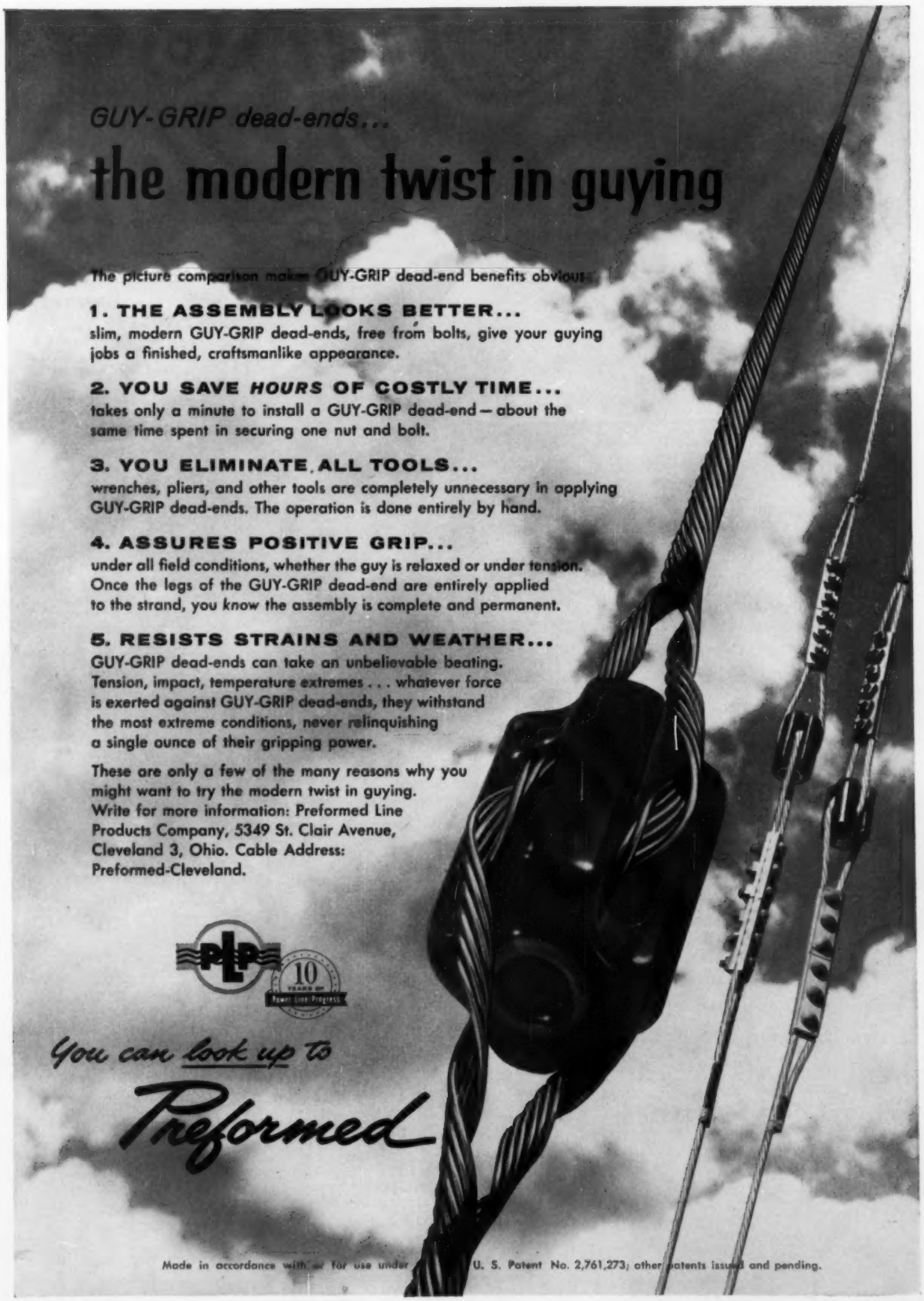
	ANNUAL CHARGE PERCENTAGES						
TYPE OF PLANT	aer. ca.	poles					
C OF M							
PROPERTY TAX							
INCOME TAX							
DEPRECIATION							
MAINTENANCE							
TOTAL %							

Table 14

5.000 Present Worth.

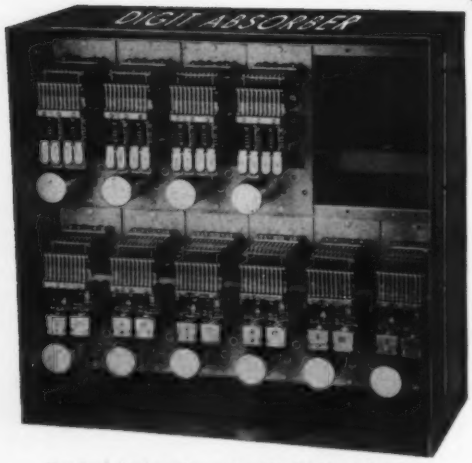
5.100 The present worth of a charge or payment is the amount of money necessary today which, with the help

(Please turn to page 28)


GUY-GRIP dead-ends...
the modern twist in guying
The picture comparison makes GUY-GRIP dead-end benefits obvious!
1. THE ASSEMBLY LOOKS BETTER...
slim, modern GUY-GRIP dead-ends, free from bolts, give your guying jobs a finished, craftsmanlike appearance.
2. YOU SAVE HOURS OF COSTLY TIME...
takes only a minute to install a GUY-GRIP dead-end — about the same time spent in securing one nut and bolt.
3. YOU ELIMINATE ALL TOOLS...
wrenches, pliers, and other tools are completely unnecessary in applying GUY-GRIP dead-ends. The operation is done entirely by hand.
4. ASSURES POSITIVE GRIP...
under all field conditions, whether the guy is relaxed or under tension. Once the legs of the GUY-GRIP dead-end are entirely applied to the strand, you know the assembly is complete and permanent.
5. RESISTS STRAINS AND WEATHER...
GUY-GRIP dead-ends can take an unbelievable beating. Tension, impact, temperature extremes . . . whatever force is exerted against GUY-GRIP dead-ends, they withstand the most extreme conditions, never relinquishing a single ounce of their gripping power.
These are only a few of the many reasons why you might want to try the modern twist in guying. Write for more information: Preformed Line Products Company, 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable Address: Preformed-Cleveland.
PLP
10 YEARS OF Power Line Progress
You can look up to
Preformed
Made in accordance with or for use under U. S. Patent No. 2,761,273; other patents issued and pending.

Can your Switchboard handle

2-5 DISTANT DIALING?



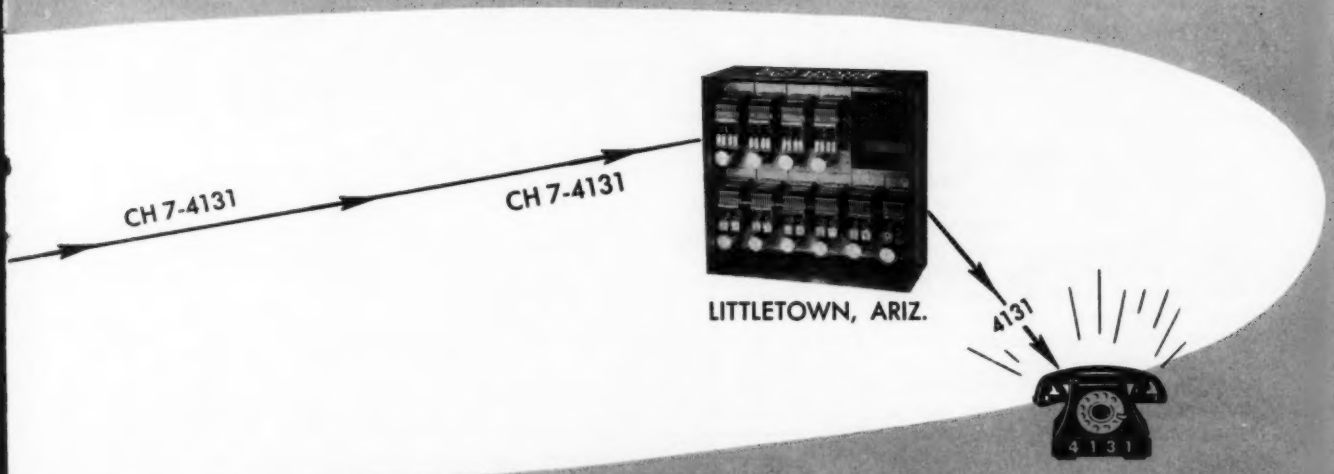
Typical Relay Case for Digit Absorber.

The Universal Digit Absorber employs simple circuity with a magnetic impulse counter, together with other standard relay apparatus of recognized manufacture.

Other UNIVERSAL Telephone Equipment:
Code-to-Selective RINGING CONVERTER
COMPUTER INTERCEPT

INDEPENDENT

It can with a UNIVERSAL DIGIT ABSORBER*



DIRECT DISTANCE DIALING REQUIRES A 2-5 CODE

The nationwide dialing plans for operator and direct distance dialing require that all stations be recognized by a 2-5 code. Few dial switchboards of earlier design have provisions for adding digit absorbing features economically. The Universal Digit Absorber fills this need easily and at nominal cost. Installation requires very little time.

The ever-increasing requirements of Extended Scope Dialing on a universal numbering arrangement are easily handled by the Universal Digit Absorber. The Digit Absorber is a factory assembled, fully-wired, applique unit that can be added to any existing dial switchboard to pad in three digits of exchange code (ABX) or four digits in the case of a small digit dial unit.

There are two types of Universal Digit Absorbers, depending on the complexity of the exchange codes assigned:

*19-S unit will handle exchange codes, as illustrated by AB-X, where the "X" digit is not a duplicate of the "A" or "B" digit.

*19-L unit is required where the "X" digit is a repeat of either the "A" or "B" digit.

In addition, Universal offers a Trunk Digit Register unit which can be applied to "Trunk on Line" dial units where five or more digits are required to be delivered to a 3 or a 4 digit tributary exchange.

*Pat. Pend.

TELEPHONE DIVISION

UNIVERSAL
CONTROLS CORPORATION
OFFICE AND PLANT – CARROLLTON, TEXAS
MAIL ADDRESS – P. O. BOX 13122, DALLAS 20, TEXAS

KELLOGG
A DIVISION OF IT&T
6650 S. CICERO, CHICAGO 38, ILLINOIS

SALES OFFICES

5924 S. PULASKI RD. CHICAGO 29, ILL.
1515 TURTLE CREEK BLVD. DALLAS 7, TEXAS
4501 TRUMAN ROAD KANSAS CITY 1, MO.
1555 WEST FOURTH STREET MANSFIELD, OHIO
23 BRODERICK ROAD BURLINGAME, CALIF.
1594 SOUTHLAND CIRCLE, N. W. ATLANTA, GA.
6100 EXCELSIOR BLVD. MINNEAPOLIS 16, MINN.
165 PROSPECT STREET PASSAIC, N. J.

Mail this coupon to the nearest address.

Gentlemen: I am interested in your Universal *Digit Absorber* for 2-5 Numbering.

Name_____

Position_____

Firm_____

Address_____

City_____ State_____

T-3-29

of accumulated compound interest, will amount to the sum required to pay the charge or make the payment when it falls due at the future date.

When a person stands at one end of a long straight stretch of railroad track and looks ahead into the distance, the rails seem to converge; that is, the distance between the rails seems to become less and less, the farther one looks down the track. If the person walks along the track, however, he sees the rails are actually everywhere the same distance apart.

In economic selection studies, the charges (annual or non-recurrent) on an item of plant or equipment are analogous to the actual width between the rails. The apparent width between the rails at some distance ahead corresponds to the present worth of the charge. It appears smaller by an amount which is the difference between the actual distance between rails and the apparent distance. This difference represents compound interest for a period equivalent to the time between now and the date the future charge falls due.

Distance and time may be said to be similar in that each of them extends ahead of a person. The location of the person standing on the railroad track represents today or the present time. The length to the point where the apparent distance between the rails is observed represents the years from now until that particular charge must be paid.

6.000 Present Worth Studies.

6.100 Present worth studies are made when plant is added or removed after the opening date of the study. If, according to the conditions of the plan, plant is to be added to or removed from at least one plan of the study one or more times after the opening date, the annual charges applicable to these additions or removals, together with those of existing items not to be removed, must be reduced to a present worth basis for comparison with those of other plans.

Each plan of the study may consist of one or more items. The amount of money required now (i.e., the present worth) to pay all the charges occurring each year for a period of years in the future on each item included in the study has the assistance of the compound interest (at the cost of money rate) accruing from today until the date the payment falls due. The total of the present worths for all the items in the plan is the present worth of that plan, and is to be compared to the present worths of the other plans to discover which plan has the smallest present worth.

The study period should be sufficiently long to obtain a good comparison between the plans. A kind of program must be developed for the future. At the end of the study period, each plan should produce as nearly as possible the same results. The economy of obtaining these results by various methods is the study itself.

It must be borne in mind that the period should scarcely be 15 or 20 years long, as predictions of growth, materials (both in amounts and types), prices, labor rates, annual charge rates, etc. are apt to be rather poor for

(Please turn to page 50)

ITEM	INVESTMENT	ANNUAL CHARGES		PRESENT WORTH			
		PER CENT	AMOUNT	PERIOD	FACTOR	TABLE	AMOUNT
Cable	2,800	13.98	391				
Mtce. on cable			113				
			504	15	9.108	11	4,590
TOTAL							4,590
EQUATED ANNUAL CHARGE			504				

ANNUAL CHARGE PERCENTAGES							
TYPE OF PLANT	Cable						
C OF M	7.00						
PROPERTY TAX	1.80						
INCOME TAX	4.00						
DEPRECIATION	1.18						
MAINTENANCE	$113						
TOTAL %	13.98						

Table 16

ITEM	INVESTMENT	ANNUAL CHARGES		PRESENT WORTH			
		PER CENT	AMOUNT	PERIOD	FACTOR	TABLE	AMOUNT
Equipment	1,875	11.75	220				
Mtce. on equipt.			135				
			355	8	6.210	11	2,205
Equpt. LSD 1790				8	.627	8	1,122
TOTAL							3,327
EQUATED ANNUAL CHARGE			536	8	6.210	11	

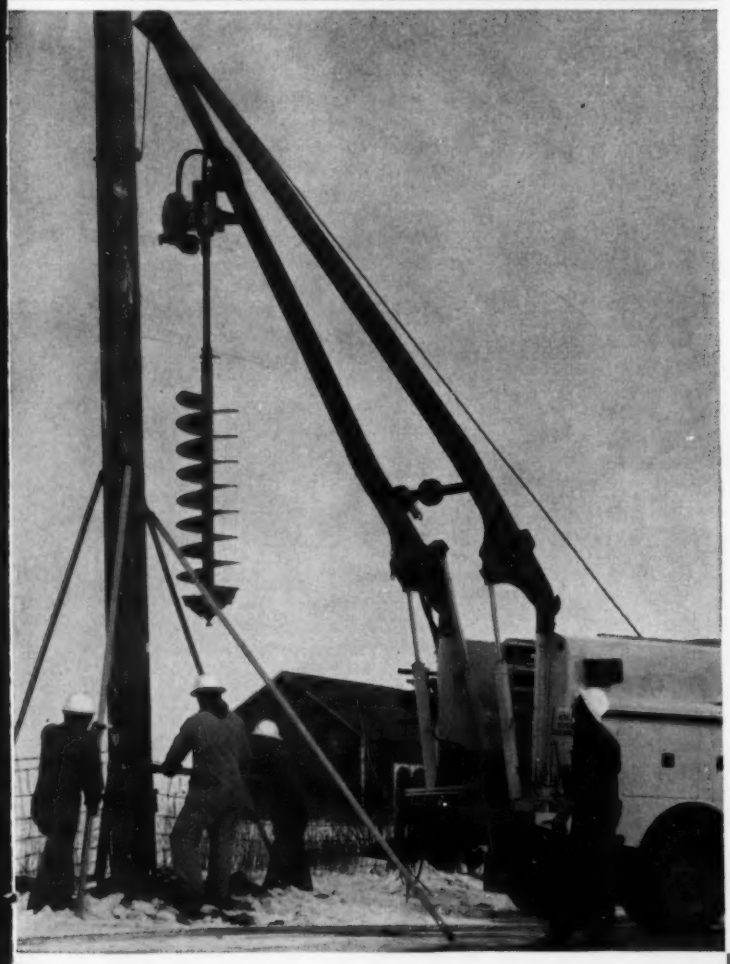
ANNUAL CHARGE PERCENTAGES							
TYPE OF PLANT	Equipt.						
C OF M	6.00						
PROPERTY TAX	2.10						
INCOME TAX	3.65						
DEPRECIATION	LS $1790						
MAINTENANCE	$ 135						
TOTAL %	11.75						

Table 17

ITEM	INVESTMENT	ANNUAL CHARGES		PRESENT WORTH			
		PER CENT	AMOUNT	PERIOD	FACTOR	TABLE	AMOUNT
Equipment	1,875	21.39	401				
Mtce. on equipt.			135				
			536	8	6.210	11	3,327
TOTAL							
EQUATED ANNUAL CHARGE			536				

ANNUAL CHARGE PERCENTAGES							
TYPE OF PLANT	Equipt.						
C OF M	6.00						
PROPERTY TAX	2.10						
INCOME TAX	3.65						
DEPRECIATION	9.64						
MAINTENANCE	$135						
TOTAL %	21.39						

Table 18



Meet the derrick that has more power in the low ranges

Holan Series 6800 Derrick gets extra power from extra cylinders

As you can see, some people have already met the new Holan Series 6800 Power Derrick—met it, used it and liked it!

They like the two sets of cylinders that give more power in the low ranges—more power for lifting, more power for forcing diggers into hard ground. They like the exclusive dial load-indicator to quickly show capacity in any position. They like Holan's lighter-but-stronger fabricated, rectangular side legs. And they like live-boom action with a single-drum winch.

The 6800 handles 8,000 pounds . . . sets 65-foot poles . . . body-loads 4,000 pounds . . . and lifts 2,000 pounds when only 5½ feet from the ground. To learn some more facts, meet the man who can tell you all about it, a Holan Field Representative. Call or write.

OTHER EQUIPMENT IN THE PHOTO:

Series 4095 Hydraulic Jacks, self-stowing, move to full extension in 8 seconds, return to stowed position in 6 seconds. 14,000-pound capacity.

Body is CMC-164. All Holan bodies are made of hi-tensile, rust-resistant steel 20 to 25% lighter than ordinary steels.

Series 4401-H Hydraulic Earth Borer digs holes 8" to 20" wide, 8 feet deep. Power feed attachment in photo uses weight and power of derrick to force digger into ground. Note that hydraulic lines from digger in photo run along side leg instead of hanging loose.

J.H. HOLAN® CORPORATION

4100 WEST 150TH STREET
CLEVELAND 11, OHIO

OTHER PLANTS: HOLAN CORPORATION OF GEORGIA, Griffin, Ga.
J. H. HOLAN CORPORATION, PHOENIX DIV., Arizona
BRANTFORD-HOLAN LIMITED, Brantford, Ontario

THE NAME THAT MEANS WORK SIMPLIFICATION

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

WE ARE well aware of the fact that nobody likes taxes, but it does seem that the present tax rate on telephone service is most unfair, out of proportion, and unreasonable. As an example, the telephone bill for the Blain residence last month was $10.55. Of this amount, $1.60 was for taxes—U. S. excise tax 90 cents and a local tax of 70 cents imposed by the village in which we live.

•

Recently, the PBX in the Capitol building of the nation's capital in Washington, D. C., was converted from manual to automatic operation. Then, the House clerk and the Senate's sergeant-at-arms thought that some members of Congress might be too cantankerous to accept the change to dial service with good grace.

So it was planned to install two telephones on each desk, one manual and the other dial. If a member doesn't want to use a new Capitol dial telephone he can pick up the manual and ask an operator to get his number.

It was conceded that the second instrument is completely unnecessary. If a member wants to use the old system and have the operator call his number, he need only dial "0" and give his number to the operator. It was explained, however, that some members have mechanical ability while others do not.

Rep. John E. Henderson (R.-O.) had his manual telephone removed. He branded the two telephones on each desk as nothing but "bureaucratic" waste and a sample of "rank-happy" Washington. About 15 other members also refused to have their second telephone installed.

This new exchange is a 28-position, 3900-line automatic PBX that replaces a 50-position manual switchboard. Back in 1925, the average number of all types of calls handled daily by the switchboard serving the Capitol was 27,000. Today, the average number of calls handled daily is about 60,000. About 26,000 of these calls are intercommunicating.

This is a far cry from 1897, during the McKinley administration, when the first one-position switchboard was installed in the Senate reception room of the Capitol to serve 51 extensions. This switchboard was operated by three page boys.

•

Wisdom has been defined as knowledge in action.

•

Capillary action ink control in a new type of drafting pen makes it possible to draw a line more than 1,000 feet long without refilling. When the pen is in contact with the paper, the proper amount of ink is drawn from its reservoir. The flow stops instantly when the pen is lifted. Five interchangeable ruling nibs range in width from hairline to $\frac{1}{16}$-inch.

Rubber base, fountain pen, colored or India inks, and water colors may be used in this pen on any medium, including paper, acetate, cloth, Mylar, or glass. Lettering attachments are available that permit the use of the pen with any lettering guide or template, as well as for free-hand work.

•

"A Man's Prayer" was written a long time ago, and the author is unknown, but, in our opinion, it is worth repeating in this day and age when it is so easy to forget the Golden Rule.

"Teach me, Oh Lord, that 60 minutes make an hour, 16 ounces one pound, and 100 cents one dollar. Help me so to live that I can lie down at night with a clear conscience, without a gun under my pillow and undaunted by the faces of those to whom I have brought pain.

"Grant that I may earn my meal-ticket on the square, and that in earning it I may do unto others as I would have them do unto me. Deafen me to the faults of the other fellow, but reveal to me my own.

"Guide me so that each night when I look across the table at my wife, who has been a blessing to me, I will have nothing to conceal.

"Keep me young enough to laugh with little children and sympathetic enough to be considerate of old age.

"And when the day comes of darkened shades and the smell of flowers, the tread of soft footsteps and the crunching of wheels in the yard, make the ceremony short and the epitaph simple: 'Here lies a man.' "

•

Many things were going on in this country 100 years ago. While 1858 was not a memorable year for battles or voyages of discovery, it was a time of progress on many fronts. Communications were advanced when Cyrus W. Field completed laying the Atlantic submarine cable between Newfoundland and Ireland in August 1858.

There were other developments, too, for in 1858 all sorts of new things came along to make life easier. The first rotary-motion washing machine was invented. A pencil with an eraser attached was patented. Steel pens were first manufactured commercially. "Arctics," waterproof gaiters of rubber and cloth, were patented.

In January 1858 the firearms industry was revolutionized when Smith and Wesson announced a newly invented metallic cartridge that made possible breech-loading rifles and revolvers. George Pullman built his first sleeping car in 1858. And in Boston in the same year the first street-corner mail boxes were erected.

We wonder if people who will be living in 2058 will look back on 1958 and place the same value on our accomplishments as we do for the people who lived in 1858. Perhaps this year will be credited with the real start of the missile era.

TELEPHONY'S ELECTRONICS SECTION

BY HAROLD B. McKAY, ELECTRONICS EDITOR

CENTURY OF PROGRESS (?)

IF YOU are dismayed at the regularity with which electrical apparatus breaks down, you may take heart from the knowledge that it was ever thus. The first underwater telegraph cable, which was laid in New York harbor lasted just 24 hours, when the dragging anchor of a ship pulled it apart.

This year marks the 100th anniversary of the first successful transatlantic cable. At about 2:30 a.m. on Aug. 5, 1858, Cyrus Field banged on the door of the telegraph house at Trinity Bay, Newfoundland, and announced that he had brought a cable, the other end of which was in Valentia, Ireland.

The triumph was short-lived. Within a month the gutta-percha insulation failed and the Atlantic cable became as silent as the ocean deep. It is interesting to note that the cable failed gradually, and occasional words were received before failure became complete. The last word ever to be received over that first cable was a challenge to the dedicated pioneers who founded the electrical communication business.

The last word was "forward."

It was not until 1866 that a more durable cable was completed. It had to wait for more knowledge of the electrical art and it required the impetus of the Civil War.

The 1858 cable failed because the electricians tried to operate it at 2,000 volts. Later, when the 1866 cable was in use, probably one of the earliest miniaturization attempts was made. Communications across the ocean was accomplished with a battery made from a lady's thimble. This led Cyrus Field to observe that "God was not in the earthquake, but in the still, small voice."

Men apparently made the same mistakes then as they do now. If you have ever been perplexed because two pieces of equipment of different manufacture could not be made to work together, consider the plight of the Atlantic cable layers. The cable was made by two different manufacturers, who apparently weren't on speaking terms. At any rate one company gave a lay or twist of one direction to his cable, the other twisted his the opposite way.

The people who spliced the two together in the middle of the sea had to invent a splicing frame to keep the cables from unwinding.

"THE MOSQUITO"

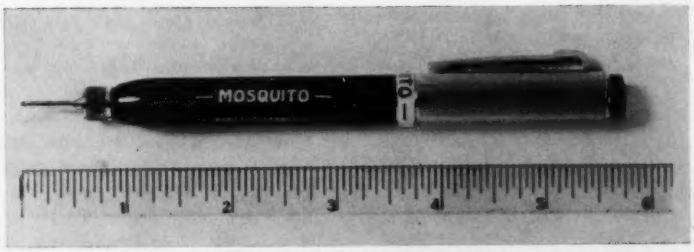
AS THE telephone plant becomes more electronic, more techniques and devices common to the radio field are finding their way into the telephone business. A wide range of test equipment, for instance, is available for use with electronic circuitry. Many of these items could make the telephone job simpler and easier if used in the telephone plant.

In line with this, a series of articles is now being prepared for publication in TELEPHONY, which will explore the use of "kit" types of equipment for use by telephone men. During the gathering of this material a product was discovered, which, while not a kit, seems to have promise of use in the telephone field.

The use of a common buzzer has long been used by telephone people to test continuity of circuits and to provide audible tones. Such equipment has often proved to be bulky and unreliable to say the least.

Now the same thing is available in the size and shape of a fountain pen, which will fit into your shirt pocket. This is called, appropriately enough, The Mosquito. It consists of a transistor oscillator powered by a single tiny pen light cell; it oscillates at a frequency of about 2,000 cycles per second, and its wave form as viewed on an oscilloscope is square with a sharp spike. This results in a rich supply of harmonics in both the audio and radio frequency spectrums.

When used to shoot trouble in a radio or an amplifier, The Mosquito is turned on by sliding the pocket clip downward. The point of the instrument is then probed into different parts of the circuit, and a tone emerges from the loud speaker of the set. It matters not whether this instrument is probed into the radio frequency or audio frequency end of the circuit, because of the



The "Mosquito" is a shirt-pocket sized transistor oscillator which can be used to shoot trouble on carriers, repeaters and telephone instruments.

wide range of harmonics. As long as the radio circuit is intact, the tone will come out. When the defective tube, or other unit of equipment, is located in the set, the tone will cease.

The manufacturer was kind enough to supply one of these instruments for testing in the telephone plant, and a number of tests were made on carriers, repeaters, and just plain telephones. The Mosquito is a useful tool for telephone men because it puts out an alternating current and in conjunction with an ordinary telephone receiver enables a repairman to test parts of the circuit which could not be checked with direct current alone. For example, the receiver circuit in a telephone instrument is usually coupled by means of a condenser and induction coil to the line, and direct current does not flow through it. A receiver, coil, or condenser can easily be tested by sending the signal into the line 1 and line 2 terminals of the set and listening for the tone.

The ac developed by this instrument emerges from the tip of the probe. The ferrule and the body of the instrument are equivalent to the neutral or ground or other side of the circuit. Measured on a voltmeter, about 1 volt is generated by the device, the power into a 600-ohm load is about—18 db; therefore, to test a circuit which has no amplification usually requires that both the probe and the body of the instrument be connected to the circuit. In some cases like in a telephone subset, the probe may touch L1 and the body touch L2.

In equipment like repeaters and carriers where amplification is present, it is usually only necessary to connect a point of the probe to the input circuit. The hand and body of the person holding it usually provides sufficient capacity to complete the circuit. A degree of volume control can be obtained by different methods of holding the instrument. Part of the barrel is insulated, and part is metallic. If it is held by the insulated portion less volume results than when it is held by the metallic part.

The Mosquito was tested on a Sierra electronics vacuum tube voltmeter to determine its application in the carrier field. The harmonics generated ranged from—18 dbm at 20 kilocycles to—60 dbm at 250 kilocycles.

This would indicate that this tool could be used in the lower carrier frequency ranges. While it is good for radio sets that tune to 500 kilocycles or more, a telephone carrier has neither the number of tubes or amplification that the radio set has, so the signal from The Mosquito might prove rather faint in the "N" carrier range.

However, it was found to be quite useful in bench checking carrier units by the signal tracing method. That is, a telephone receiver can be put on the output and The Mosquito used to probe through different parts of the circuit looking for an open. If used on a carrier channel which is in service, the harmonics could cause interference on other channels, while an over-all voice frequency path containing a compander might reduce the Mosquito's tone to a value too low to be used. However, it can be used to check each of the component parts of the circuit.

It would seem that this instrument can serve a real purpose around a telephone office for making continuity tests of resistors, capacitors, transformers, and coils. It could also be used for quick transmission tests on repeaters, carriers, recorders, and instruments. You can get more information on the Mosquito from the Don Bosco Electronics Co., 1099 S. Orange Ave., Newark 6, N. J.

ELECTRONIC ABSTRACTS

NOWADAYS scientists and engineers record their findings and theories by publishing a report or "Paper." These may be presented before conventions, or published in engineering journals. Other people then digest, or abstract these papers and publish them in various indices. These abstracts may or may not be accurate depending upon the training of the man who makes them. Also many months might elapse before abstracts get into print.

An effort to simplify this tremendous job is being made by the International Business Machines Co. An IBM 704 Electronic Data Processing System is being used to analyze scientific articles. The huge computer selects significant sentences and reproduces them on an electronic printer, so a researcher can tell at a glance whether the material is of value to him.

The machine works on a system known as auto-abstracting, in which the article is fed on magnetic tape into the machine. The machine reads the article from the tape, and though it is incapable of actually thinking, or understanding, it can determine the significance of words by measuring their frequency of use in different word combinations. The machine can thus scan an article and extract the sentences, which have the greatest significance.

TRANSISTOR SWITCHES

TELEPHONE companies like other users of electric power often require that electric power to be available in different forms and different voltages. When it is desired to convert alternating current voltage from one value to another, a transformer is usually used and transformers are quite efficient.

Where direct currents are involved, the situation is quite different. A telephone company might convert ac service into direct current for charging batteries by means of motor generators, or rectifiers, with varying degrees of efficiency.

Similarly inverters are used to change dc to ac, when batteries are required to deliver emergency ac power. DC from low voltage batteries must often be stepped up to a higher dc voltage for the plate supply of repeaters and carriers.

Various rotory devices exist for such purposes and in addition vibrators or choppers are used. An example of this is the vibrator as used in a auto-radio, which chops the battery voltage into a type of ac which is then stepped up by a transformer and then rectified back to a higher voltage dc. Some progress has been made in using transistor oscillator circuits for this sort of application.

The February issue of the *Bell Laboratories Record* describes another approach to this problem of converting voltages. This idea uses transistors with a special transformer.

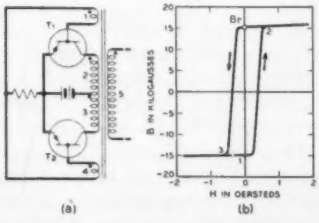


Fig. 1. Basic circuit (a) of the transistor-core inverter, and dynamic hysteresis loop (b) of the core.

The basic circuit of an inverter using this principle is shown in *Fig. 1.* The two transistors T1 and T2 conduct alternately and apply the dc input voltage to windings 2 and 3 of the transformer, while the other two windings 1 and 4 control the switching of the transistors. This produces a nearly square wave ac output at winding 5.

The operation of the circuit depends upon the properties of the transformer core material. The abrupt saturation of the core material produces changes in the feedback voltages, which force the transistors to switch instantly and rapidly. This circuit operates at much higher frequencies than the usual vibrators and dynamotors, hence it permits the use of smaller transformer and filter components.

The transistors actually act as electronic switches in this circuit. When one is conducting, the other is open. In this kind of circuit, the transistor only dissipates a small fraction of the total power being controlled, hence high efficiencies can be achieved with the device. A direct current output can be obtained from a circuit of this type by connecting a rectifier to the transformer winding 5.

Power in the order of 100 watts at 2,000 cycles per second has been obtained with devices of this sort. Unlike a vibrator the transistor has no contacts to wear or pit and will, therefore, give more reliable performance. Experimental inverters of this sort have operated for more than 5,000 hours without transistor failure.

STANDARD AMPERE

THE VOLT, the ampere, and the ohm are, like other measurements developed by man, valueless unless someone sets up primary standards. That is, somewhere there must exist a standard volt and a standard ohm by which the accuracy of meters can be gauged.

For example, you can get a so-called standard cell, voltage of which is known to a precise degree. The United States Bureau of Standards keeps such things on hand. Among the primary standards maintained by the bureau are those for two basic electrical quantities, voltage and resistance. A standard of voltage, of course, can be a cell. A standard of resistance, a precisely measured resistor.

A standard ampere is something else. It isn't something that can be stored in a bottle, or wound on a core, but must be produced at the time it is needed from a standard volt and a standard ohm and the use of Ohm's law.

However, over a period of years, changes might occur in the voltage or resistance standards, so the bureau conducted a recent experiment to determine if the standard ampere had changed any since it was originally evaluated in 1942.

To measure the ampere accurately, a so-called helical coil balance is set up. This consists of a precision balance mechanism such as might be used for weighing small objects. One arm of the balance is connected to a coil, which floats inside of a larger coil. The current is sent through these coils in series and then the current in one of the coils is reversed. The resulting change in force is measured by the balance. The accuracy of the measurement is dependent upon the accuracy of the balance and the dimension and pitch of the coils.

You will probably be pleased to know that the standard ampere, unlike the dollar, has only drifted by about six parts in a million over the last 15 years.

CUBA TV

THE 185 mile over-the-horizon Florida to Cuba microwave system was the subject of a paper presented before the American Institute of Electrical Engineers. The microwave link which will supplement the cable now operated jointly by AT&T and IT&T, will handle television as well as 100 simultaneous telephone conversations.

The microwave equipment was developed by IT&T engineers in New Jersey.

MULTI-CONTACT CONNECTOR

THE rapid increase of electronic equipment in the telephone plant has brought about an increase in the number of multi-contact connectors used with plug-in components.

According to the *Bell Laboratories Record*, there are now over a million 20 point connectors in use in the Bell System. Devices of this sort have to be designed with manufacturing tolerances in mind and the multiple contact jacks made in the past were of so-called three petal construction. These jacks fitted somewhat loosely in a plastic block, but when the two mating sections were lined up by an extra long guide pin, the units could be eased together without difficulty.

Occasionally, however, a pin would strike the edge of a petal causing it to crumble and resulting in equipment failure. Considerable thought was given by the Bell laboratories to the design of a new jack, which could be used interchangeably with the old, and which would not have this trouble.

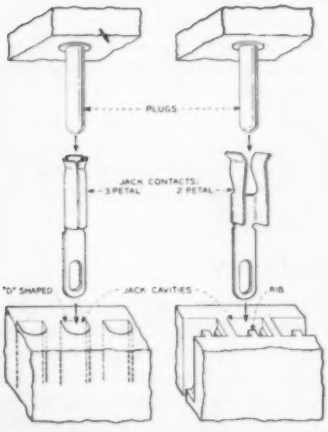


Fig. 2. Large-scale drawing showing details of jack contacts and jack cavity structures for old and new types of multiple-contact connectors.

The result is the two petal jack shown in *Fig. 2*. A rib in the plastic block restricts the movement of the pin jack to positions where it cannot be crumpled by an inserted plug. The pin is made of brass, the jack made of phosphor bronze, both are gold plated. The jack portion is held in place by twisting the soldering lug where it emerges at the rear of the plastic block. This permits easy replacement.

POCKET RADIO

SALESMEN, doctors, and others who are frequently away from their telephones may find very convenient a small pocket radio receiver that will signal them when somebody calls. Numerous approaches have been made to this type of service. Telephone people who visited the USITA convention last Fall saw the Stromberg-Carlson Pagemaster in operation.

This type of service has great possibilities and is still undergoing active development. Discussion of the whole field is contained in an article in the January issue of the *Bell Laboratories Record*. Citywide personal radio signaling is now being tested in the Allentown-Bethlehem area of Pennsylvania. In use, the customer carries a small radio receiver in his pocket or clipped to his belt. On receiving a radio signal with the proper code, the radio will emit an audible tone of sufficient loudness to let the user know he is being called. He then goes to a telephone and calls his office, or some other pre-arranged number.

One of the purposes of the Allentown installation is to answer the various operational and technical questions. Operationally, the trial is testing public reaction and also establishing the requirements of different types of users.

As presently designed, a person who wishes to call to a pocket radio station dials a number which connects him to a personal signaling operator. He gives the operator a four-digit number which corresponds to the code associated with the radio receiver assigned to the call party. The operator sets this number into a series of rotary switches which will translate the number into a code combination of four out of nine audio frequencies. A total of about 3,500 codes can be assigned on a single radio channel. Frequencies used range from 160 cycles to about 300 cycles, at about 10-cycle intervals. A 250-watt AM transmitter operating in the 35-megacycle region then sends out these tones.

The pocket receiver manufactured by Stromberg-Carlson weighs approximately 8 ounces and will fit into a coat pocket. It uses a single 4-volt battery having a life of about 900 hours. The 35-megacycle radio signal is picked up by a super-regenerative detector, which uses a surface barrier transistor. The audio tones are delivered into a two-stage audio amplifier which uses p-n-p transistors. This in turn feeds a selective reed decoder, which consists of a group of four highly selective vibrating reeds, which will respond only if the proper frequencies are applied.

When the proper code is received, a blocking oscillator, built around a n-p-n transistor, generates a new tone which emerges from a midget speaker. Depressing a small push-button silences the oscillator and makes the receiver ready for the next call. The service range varies, depending upon whether a customer is in an open area, or is partially shielded by a building, or an automobile. It is estimated that ranges from about 2 to 4 miles will be experienced. It is expected that additional transmitters would be used

where a larger area is to be covered.

Plans are under way to improve the system with equipment which will allow an operator to place a call by dialing a number or by using a conventional key set. This information will then be stored in relays and will be read out automatically by a scanning device. Each code call would be transmitted, perhaps three times to compensate for variations in radio propagation. At the end of the last of these transmissions, the code would be wiped out of the storage unit, which would then be available for service to another customer.

It is also suggested that a service of this type could share a channel used for two-way mobile telephone service. With this arrangement, the signaling calls would be transmitted only when the mobile service was idle. Much of this effort is aimed at the possibility of the transistorized receiver operating at 150 megacycles in conjunction with mobile telephone systems which operate in this frequency range.

•

COMPATIBLE CARRIER

INDEPENDENT telephone companies often use carrier systems to connect to Bell System lines. Where the Bell company used Western Electric carrier, it usually obligated the Independent company to do the same. This sometimes resulted in the Independent being in the position where it depended upon the connecting company for the engineering and line-up of the system.

Several carrier manufacturers have provided for modifications in their systems to make them completely compatible with the Western Electric "O" system. Lynch Carrier Systems, Inc., recently announced a carrier system which may be used at one end of the line while Western equipment is used at the other.

The Independent company can thus buy independently manufactured equipment complete with all of the printed material necessary to install and maintain it, without having to ask the assistance of the Bell company.

•

A MINIATURE teletypewriter for use in military aircraft was described during the winter general meeting of the AIEE. The unit weighs 29 pounds and contains 45 tubes.

. . . do your men "understand" the "mental tools" of electronics? Can they be relied upon to keep your valuable electronic equipment in top condition?

The rapid advance of electronics in the telephone industry has created a serious problem. Thousands of competent telephone technicians have no sound understanding of the fundamental concepts . . . "the mental tools" . . . of electronics.

You can solve this problem quickly and economically and your men will never be away from their jobs. Resident training programs are good, but few independents can afford the cost and lost man hours.

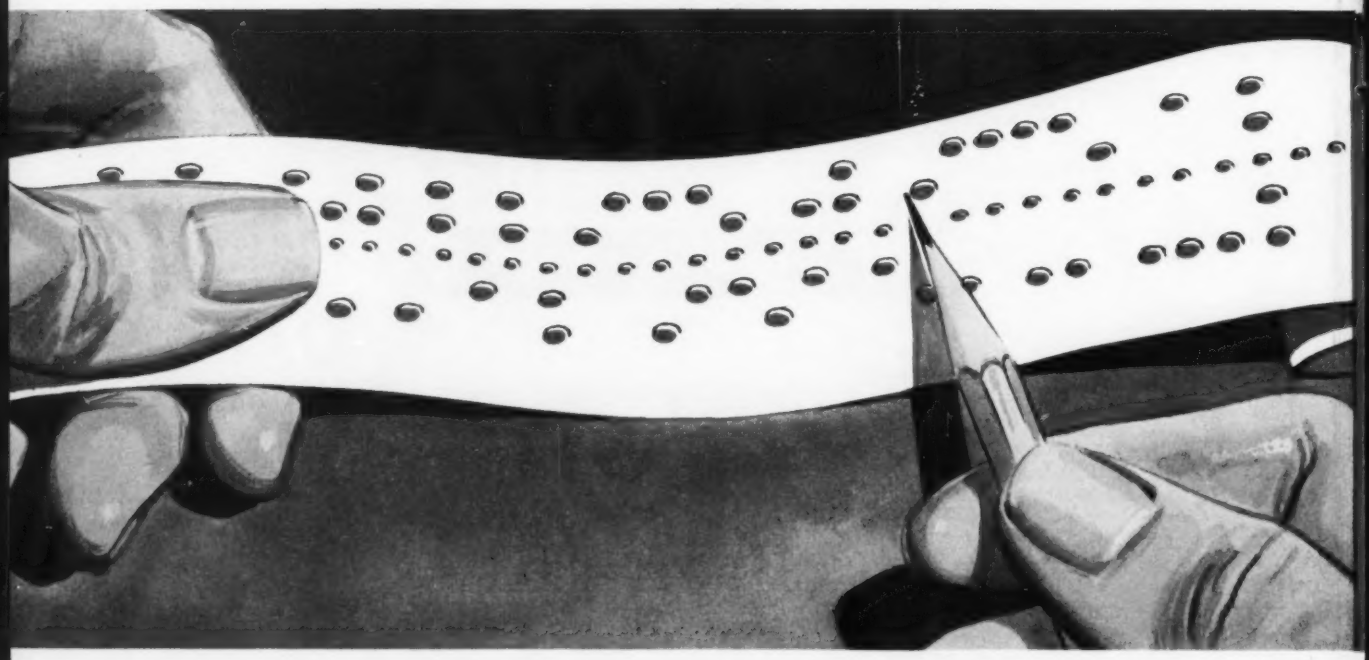
Progressive telephone companies have found the answer in good fundamental training in our Employers' Plan. If it benefits them . . . it can benefit your Company. It will be well worth your while to get the details.

Write on company letterhead for free booklet

Cleveland Institute of Radio Electronics

4900 Euclid Ave., Desk TE-17 Cleveland 3, Ohio

ONLY STROWGER AUTOMATIC GIVES YOU



Over 10% of the Independent dial telephones in the United States are served by Strowger Automatic Toll Ticketing. Introduced in 1948, SATT quickly gained acceptance among Independent Telephone companies as the ideal method of handling toll calls swiftly, without an operator. Check these advantages. See how you, too, can increase toll revenue and reduce operating costs with SATT:

- Ticketer spills complete data for each call into pool equipment instantly upon completion of the call. It's always ready for the next call—never choked by data from previous calls.
- Incomplete calls are not recorded. SATT throws out uncompleted calls before the tape is made!
- Call data is recorded on four-channel tape. This permits high-speed, low-cost machine billing.
- Complete call data for each call is recorded on tape, quickly and permanently.
- Ample self-checking and supervisory facilities insure accurate ticketing.
- Flexible design provides for future expansion.
- With SATT, you're ready for nation-wide, direct distance dialing.

TOLL TICKETING
THESE THREE FEATURES...

1. **Idle ticketer is always ready to handle next call!**
2. **Throws out incomplete calls before tape is made!**
3. **Four-channel tape call data permits faster billing!**

SATT systems are very flexible. For example, calling-party identification may be handled: (1) automatically—even on party lines, (2) by calling-party dialing, (3) by operator keying, (4) automatically on some lines, operator keying on others. Other features, too, can be varied and combined to meet your special needs.

Ask your A. E. salesman for complete details

He'll be glad to tell you more about automatic toll ticketing. Let him show you how you can increase revenue and reduce operating costs with SATT. Write: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111.*

AUTOMATIC ELECTRIC

A member of the General Telephone System—One of America's great communications systems

GENERAL SYSTEM

today's

Highlights

of finance-taxes-business trends

by Willard F. Stanley

ABOUT THE RECESSION: The recession appears to be increasing moderately, but talk about it increases excessively, both in volume and violence. Many conflicting plans to halt it are being formulated by both political parties. The lessening in business has been primarily in the durable goods lines and unemployment is also principally in these fields. While February unemployment rose above January (to about 7 per cent of the total labor force), slowup in construction work due to unusually severe weather probably accounted for most of the February increase.

Business activity is now down from the tops about the same percentage as in the 1948-1949 and 1953-54 recessions. Corporate earnings of about 2,500 companies were up about 1 per cent in 1957, according to a survey of the First National City Bank of New York. But, for the quarter ended Dec. 31, 1957, earnings for some 600 companies tabulated were 16 per cent below the same quarter of 1956.

Proposals for relief fall generally into two basic patterns: Tax reduction and increase in public works expenditures. Another proposed remedy is lengthening the period of unemployment insurance payments and/or increasing these payments. The administration seems to have veered toward the tax reduction panacea--while Democrats seem to favor public works and tax reduction. The difficulty with the public works solution is it doesn't operate very fast, while a tax cut wouldn't seem likely to stimulate durable goods expenditures--the seat of most of the trouble both in lower productivity and unemployment.

* * * *

GLUT OF BOND OFFERINGS RAISES YIELDS: As we feared, the unusual quantity and amount of new issues of public utility funded debt brought to market between February 20 and Mar. 6, temporarily loaded the shelves of the underwriters and brought a prompt increase in yields on new long-term debt offerings. In late January, an "AA" rated issue of utility bonds was offered on a 3.6 per cent basis. On Mar. 6, a similarly rated utility issue went to the public on a 4.22 per cent basis, an increase of 17 per cent in the cost of this type of funds in something like six weeks.

This increase in yield was unquestionably due to the congested offering schedules prevailing during the two weeks preceding the latter date. Some constructive plan should be developed for coordination between issuers to minimize these "feast or famine" situations in the new offering security market.

Recent further reduction in rediscount rates caused some improvement in bond

Mr. Stanley, formerly a utility financial executive, is now president of Corporate Services, Inc. of New York City and is well known as a financial writer. He is a member of the Controllers Institute of America and the New York Society of Security Analysts. He serves on the Finance Management Committee and the Tax Committee of the Controllers Institute (N. Y. Control). His articles are appearing once a month in TELEPHONY.

NEW

COPPERPLY® WIRE

FOR TELEPHONE LINES . . . *bare or insulated*

FOR RURAL DISTRIBUTION LINES . . . *guy strand or messenger*

Copperply wire introduces a unique combination of advantages and economies. For example: better balancing of circuits, suitability for future carrier circuits without additional line work, extended service life, improved long span installation, and sizeable economies both in insulating the wire and in line construction.

These gains stem largely from precise concentricity, linear uniformity, and a non-porous rust proof copper coating permanently united with a high tensile, precision-drawn steel core, as well as availability in continuous *non-welded* lengths up to 1,000 pounds.

Copperply is now available in High Strength and Extra High Strength grades, with either 30% or 40% conductivity, and in all standard sizes from No. 3 to No. 14 AWG.

Bulletin 202 gives additional data. Write National-Standard, Niles, Michigan.

NATIONAL NS NATIONAL-STANDARD **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *fine wire, stainless, music spring and plated wires* • WORCESTER WIRE WORKS, Worcester, Mass.; *music spring, stainless and plated wires, high and low carbon specialties*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • ATHENIA STEEL, Clifton, N. J.; *flat, high carbon spring steels* • REYNOLDS WIRE, Dixon, Ill.; *industrial wire cloth*

prices and by Mar. 11 an "AA" rated utility bond issue was marketed on a 4 per cent basis, considerably better than a week earlier, but still substantially below the late January level.

The consensus seems to be that new offering yields should hold somewhere around mid-March levels at least temporarily, with possibility of somewhat lower yields later in the year. So far, offerings of long-term federal debt haven't seemed to materially affect the corporate bond market, but this possibility still overhangs the situation, although the higher yields should lessen somewhat the pressure to fund federal short-term debt.

Under present circumstances there seems no reason for utilities needing long-term debt funds in the next few months to follow anything but normal procedure in bringing them to market. A drastic increase or decrease in yields from those existing around mid-March seems unlikely, although there still exists possibility of a gradual lessening of yields later this year if the recession continues.

Utility common stocks have continued to hold at good levels, making this type of financing desirable where equity funds will be needed as far ahead as a year or somewhat longer.

* * * *

STOCKS STAGE PRE-SPRING RALLY: Somewhat surprising, in the light of the many doleful utterances and statistics released during the 30 days preceding March 20, has been the improvement in stock market averages during this period.

New York Times 50 combined stock average was 5 per cent above Dec. 31, 1957, as of March 16, compared with 2 per cent at Feb. 18. This reflects an improvement of about 3 per cent in this 30-day period.

The rise in market levels has been steady, though not spectacular. For instance, the averages improved for eight consecutive business days ending March 11. Utilities continue a strong-point in the market, combining protection with expectation of mild appreciation. Missile stocks continue to be popular, but must be viewed as highly selective, special information being needed to judge how far favorable prospects have already been discounted in existing price levels.

Over the next few months we do not look for substantial changes in market averages as against mid-March levels, although a moderate technical correction may occur. But this should be temporary and cancel out only part of the recent rise in stock prices. Before making further investment commitments, careful analysis of impact of a continued recession on particular industries and particular stocks therein remains highly essential.

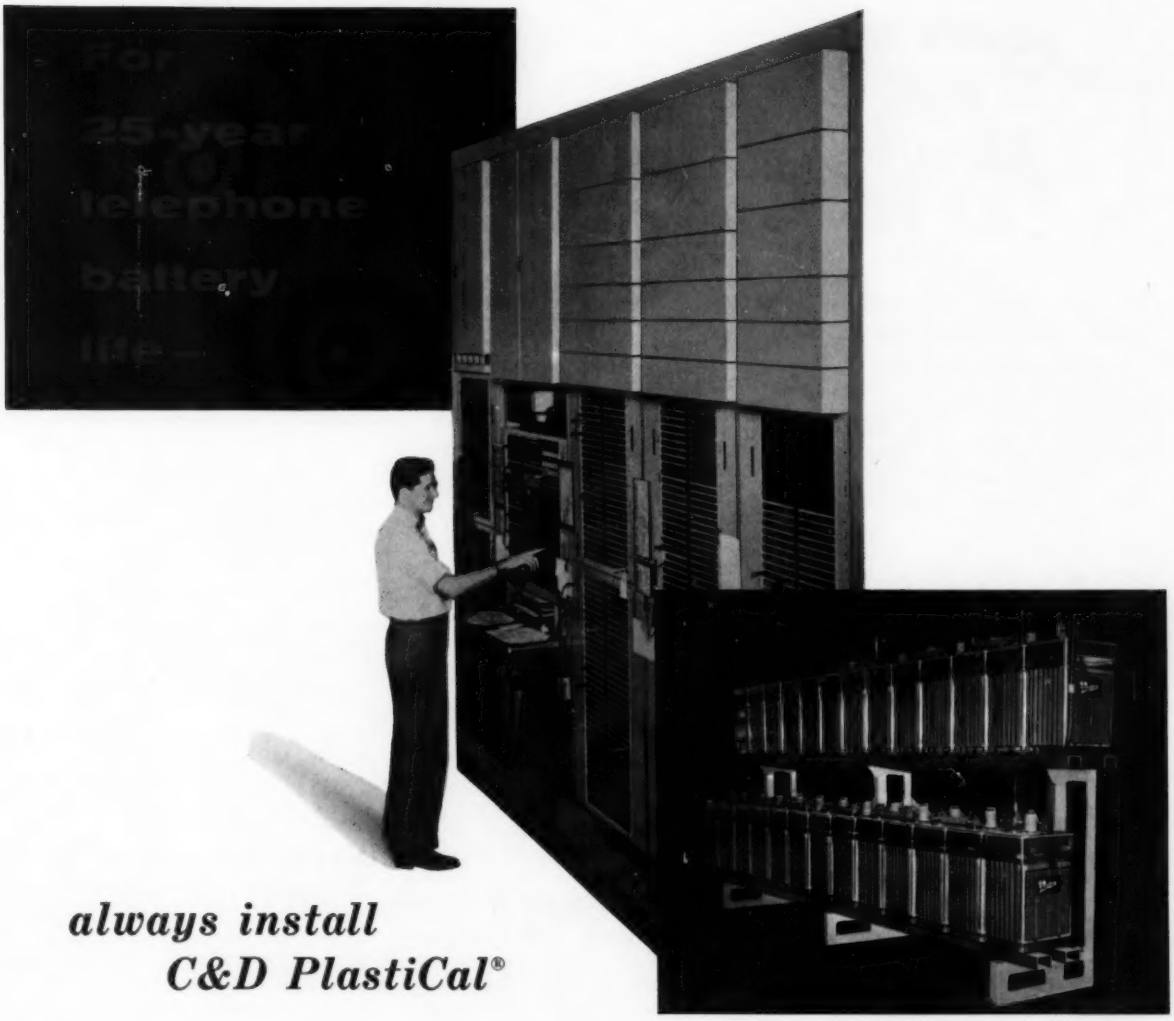
* * * *

1957 INCOME TAX DEDUCTIONS: Among the court decisions relating to federal income taxation during 1957, which may be of interest to utilities are:

(1) A decision holding that failure of IRS to object to an accounting method employed in any tax year constitutes a waiver, which estops the service from thereafter questioning such change.

(2) A decision holding that salvage value must be determined in advance of employing any of the permitted methods of depreciation, i.e., straight line, sum of the years digits, or declining balance.

(3) A decision confirming previous law to the effect that depreciation adjustments made with IRS approval as to any year are not necessarily binding on IRS with respect to subsequent years. This doctrine customarily applies only when there has been some change in the situation, or in knowledge thereof, warranting a different life expectancy for the property involved.



always install C&D PlastiCal®

Why? Because C & D PlastiCal® batteries are the most advanced-design batteries of the last 50 years.

PlastiCal lead-calcium alloy grids are completely free from the harmful life-shortening effects of antimony found in conventional telephone batteries. By comparison, a C & D PlastiCal requires from 1/10th to 1/100th the current to maintain itself in a fully charged condition. Thus, frequency of water additions is drastically reduced.

A PlastiCal in the battery room means you can check the electrolyte level by glancing at the clear plastic case. Patented, exclusive C & D Saftee-Vents reduce maintenance by serving as always-ready, efficient funnels for temperature and hydrometer readings—*without* removing the vent.

If you need telephone batteries—a C & D representative or your telephone equipment supplier will be glad to explain the many advantages gained by installing C & D's premium telephone battery—PlastiCal. *Call him today!*

For details, write for descriptive Bulletin

C&D BATTERIES, INC.

of Conshohocken, Pa. ... Attica, Ind.

SINCE 1906

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

Manufacturers of *Slyver-Clad* ® Industrial Batteries • PLASTICELL and PLASTICAL ® Batteries for Communications, Control and Auxiliary Power

Courts and Commissions

OK Answering, Recording Rates, Financing Plea in O.

The Cincinnati & Suburban Bell Telephone Co. received permission on Feb. 25 from the Ohio Public Utilities Commission to amend its tariffs in order to establish a new type of answering and recording equipment service.

The new type of service provides a longer answering and recording cycle, greater message capacity, optional retention of recorded messages, and loud speaker playback. The description and rates and charges for the two types offered are as follows:

	Non-Recurring Charge	*Monthly Rate*
Type 1—Magnetic drum type with answering and recording cycle of one minute	$15.00	$12.50
Type 2—Combined magnetic wire and disc type with answering and recording cycle up to three minutes, optional retention of recorded messages and loudspeaker playback.	15.00	20.00

•

The commission also authorized the Paulding Telephone Co. to issue 80 shares of 6 per cent $100 par cumulative preferred stock; and borrow $426,000 from the Rural Electrification Administration.

Falls at Excavation Site; Wins $40,000 Damages

A one-million-dollar damage suit was brought by Joyce Renee Wasserman, a former concert violinist, against the New York Telephone Co. and a subsidiary, The Empire City Subway Co., Ltd., for injuries suffered in a fall at an excavation site. It was settled for $40,000 on Mar. 7 before Supreme Court Justice Jacob Markowitz.

At the trial, which lasted 15 days, Miss Wasserman brought suit against both companies. However, the complaint against New York Telephone Co. was dismissed, and the settlement involved only the Empire City group.

The accident occurred on Oct. 17, 1951. Miss Wasserman's lawyer, Louis Dubow, said the defendant company allowed the repair area to become "soft and spongy." Miss Wasserman's heel stuck in the substance, he said, causing her to fall and sustain severe injuries.

West Coast Company Asks Increase in Wash. and Ore.

The West Coast Telephone Co., Everett, Wash., has filed a petition with the Oregon Public Utility Commissioner requesting a rate increase for its Oregon exchanges. The commissioner on Mar. 5 ordered an investigation of the request.

On Mar. 3 the Washington Public Service Commission suspended for investigation rate increases asked by the West Coast company for the 25 Washington communities it serves.

The rate increases in Washington would be designed to raise the company's revenues in that state by approximately a half million dollars annually.

OK Ind. Independent Raise; Set Hearing on 2nd Company

The Waterloo Telephone Exchange was authorized on Mar. 7 by the Indiana Public Service Commission to issue $50,000 in bonds and to increase its rates (TELEPHONY, Nov. 16, p. 48).

The commission fixed the new monthly rates at $5.50 for one-party residence service; $3.50 for two-party residence service; and $8.00 for one-party business service.

•

In other recent actions the commission continued until Apr. 16 hearings on the application of the Eastern Indiana Telephone Co., Winchester, for a rate increase.

Asks Sale OK in Illinois

The Illinois Commerce Commission on Mar. 19 was scheduled to hear the application of the Midland Telephone Co. to purchase the Dorchester Telephone Co.

Pass Relocation Bill in Va.

The Virginia Legislature on Mar. 7 passed a bill requiring the Virginia Highway Commission to pay out of highway funds for the relocation of public utility facilities in cities when necessitated by interstate highway system construction.

N. Y. Company Gets $200,000 Loan from Berkshire Life

Midstate Telephone Co., Inc., of Manlius, N. Y., has closed a $200,000 first mortgage 25-year loan with Berkshire Life Insurance Co., Pittsfield, Mass., it was reported on Mar. 21 (TELEPHONY, Dec. 14, p. 43).

Proceeds of the loan are being applied to funding of bank loans which had been incurred for the company's plant expansion and construction program.

This is the Berkshire company's third loan to Midstate and its 55th piece of Independent telephone company financing.

NARUC Takes Stand for Relocation Reimbursement

Meeting in Washington, D. C., recently, the National Association of Railroad & Utilities Commissioners adopted a resolution opposing the repeal or substantial modification of Section III of the Federal Highway Act of 1956.

In so doing the NARUC was going on record in favor of reimbursement to utilities for the cost of relocating facilities necessitated by federal-aid highway projects.

Approve 6% on Fair Value For NW Bell in Minnesota

Northwestern Bell Telephone Co. on Mar. 19 secured from the Minnesota Railroad & Warehouse Commission approval of rate increases designed to produce a 6 per cent return on the fair value of the company's property (TELEPHONY, Oct. 26, p. 173).

The commission set the fair value at 216 million dollars, and estimated that under the old rates the company would have experienced a 4.45 per cent return in 1958. Amount of the gross revenue increase is $7,833,000. The net earnings increase is $3,368,000, bringing annual earnings to a $12,973,000 total.

The rate increase order affects 134

ANSONIA® NEW Ankoseal PARALLEL LINE WIRE

Two parallel Copperweld conductors insulated with the toughest black polyethylene compound for continued service under the worst conditions.

Answering The Call For Quality!

Ansonia's enviable reputation for quality is emphasized once again in this new product. You simply will not find parallel line wire that gives better transmission qualities and takes a beating in the open the way Ankoseal Parallel Line Wire does!

Install your span lengths to absolute maximum with a feeling of complete security even to heavy loading zones. Transposing ANKOSEAL Line Wire is simplicity itself . . . simply twist the desired number of turns between poles. Highest quality transmission characteristics can be obtained and cross talk eliminated in rural areas.

Ansonia Ankoseal Two Conductor Parallel Line Wire is available in #12 or #14 AWG in 5,000 or 15,000 foot reels.

Insist on ANSONIA Ankoseal *quality*

ANSONIA® Ankoseal

Aerial and Direct Burial Cables

Self Supporting Cables

Inside Wiring Cables

B.U.G. Cables

Rural Distribution Wire

THE ANSONIA WIRE & CABLE COMPANY · ASHTON · R. I.

The Oldest Name In Plastic Telephone Cables In The Most Modern Plant Devoted Entirely To Producing Plastic Cables

exchanges, which served 937,697 telephones at the end of 1957. The rate raise is the seventh since 1946; the most recent was approved on Jan. 8, 1954.

The commission said it had given careful consideration to evidence submitted to it by witnesses for the commission and the company on the rate of return as well as current value. The commission's witness, Dr. Lionel W. Thatcher of the University of Wisconsin, testified that in his opinion the company was entitled to a rate of return "within a range of 5.85 per cent to 6.25 per cent." He further stated, "I would apply it to the rate base that the commission finds." Dr. Walter Morton, of the University of Wisconsin, for the company, stated that in his opinion a 7 per cent rate of return is a "fair rate of return for the Northwestern Bell Telephone Co. in Minnesota."

The commission also stated it had duly considered the theories on hypothetical debt ratio and payout ratio applied to public utilities as expounded by Dr. Thatcher, and Dr. W. A. Morton, in their testimony. The commission then stated:

"It appears to the commission that a public utility with a minimum of mortgage debt is better able to serve the public interest continuously because it can function in accordance with a well-planned long-range construction program and is better qualified to secure money during periods of economic recession.

"We believe that choice of debt ratio and payout ratio of a public utility are problems of utility management and are outside the jurisdiction of this commission, unless excessive interest rates or dividends are being paid. The record shows that the company is prudently managed and is financially stable under its present policy of debt ratio and payout ratio."

Approve Rate Raise, Sale In Oregon; Set Rate Case

An increase of $5,193 in gross revenues for the Eastern Oregon Telephone Co.'s Boardman exchange was authorized on Mar. 17 by the Oregon Public Utility Commissioner.

The Eastern Oregon company bought the Boardman Telephone Co. in June 1956 and has since converted the Boardman exchange to automatic operation. The commissioner stated that, giving recognition to the added investment in the Boardman exchange—$32,096.78 for conversion and expansion—the rate of return to Eastern Oregon under the former rates would be 2.48 per cent on average net plant and working capital for the system, after adjustments, of $333,421.02.

The approved rates at Boardman will provide a rate of return of 3.43 per cent on the average net plant and working capital described above. The old and new Boardman rates are:

Business:		
One-party	$2.25	$7.75
Residence:		
One-party	2.25	5.75
Four-party	1.75	4.50
Ten-party	1.75	5.75

•

On Mar. 17 the Oregon commissioner also approved sale of the Medical Springs Telephone Co. to the Haines Telephone Co.; and he set for hearing on Apr. 1 the rate increase application of the Monroe Telephone Co.

Tenn. Co-op Reports Options To Buy Five Companies

The sale of two Tennessee Independent telephone companies to the Southern Bell Telephone & Telegraph Co. was erroneously reported in the Mar. 8 issue of TELEPHONY.

It had been reported that the sale of the Readyville Telephone Co. and the Lascassas Mutual Home Telephone Co. to Southern Bell had been approved by the Tennessee Railroad & Public Utilities Commission.

E. D. Hildreth, manager of the DeKalb County Telephone Cooperative, informed TELEPHONY that his company had an option to purchase the Readyville company and that the DeKalb Cooperative would exercise this option.

Mr. Hildreth also announced that the DeKalb cooperative has options to purchase four other Tennessee Independents—Woodbury Telephone Co., Milton Telephone Co., Statesville Telephone Co. and Norene Telephone Co., and that these properties would be purchased and converted to automatic operation.

Mr. Hildreth states that the purchase of the above mentioned companies would give the DeKalb cooperative 3,000 stations, served through nine exchanges, six of which are automatic.

Negotiations are presently under way with the Lascassas Telephone Co. for the DeKalb Cooperative to serve the area presently served by Lascassas, Mr. Hildreth stated.

Postpone FCC Hearing on Bell Acquisitions in Wis.

The Federal Communications Commission has postponed to Apr. 23 a hearing originally scheduled for Mar. 26 on the application of the Wisconsin Telephone Co. to acquire the Menomonee Falls (Wis.) Telephone Co. and the Lisbon Telephone Corp., Menomonee Falls.

The United States Independent Telephone Association is intervening in the case (TELEPHONY, "In the Nation's Capital," Mar. 15, p. 17).

Mich. Company Asks Raise; Gets New Owner and Name

A hearing on a proposed rate increase for the Wexford Telephone Co. of Mesick was scheduled on Mar. 14 by the Michigan Public Service Commission.

The company was sold to James R. Hoogesteger by Mr. and Mrs. David Nugent, effective Apr. 1. Mr. Hoogesteger plans to change the company's name to the Mesick Telephone Co.

The Independent has 300 subscribers which it serves through exchanges at Mesick, Copemish, Thompsonville and Buckley.

Grant Increase To Two Indiana Companies

A temporary rate increase was granted on Mar. 7 to the Eastern Indiana Telephone Co., Winchester, by the Indiana Public Service Commission (TELEPHONY, Mar. 22, p. 46).

Rates graded according to the size of the exchange, range from $4.65 to $7.00 a month for one-party residence service; $3.35 to $5.50 for two-party residence service and $6.45 to $11 for one-party business service.

•

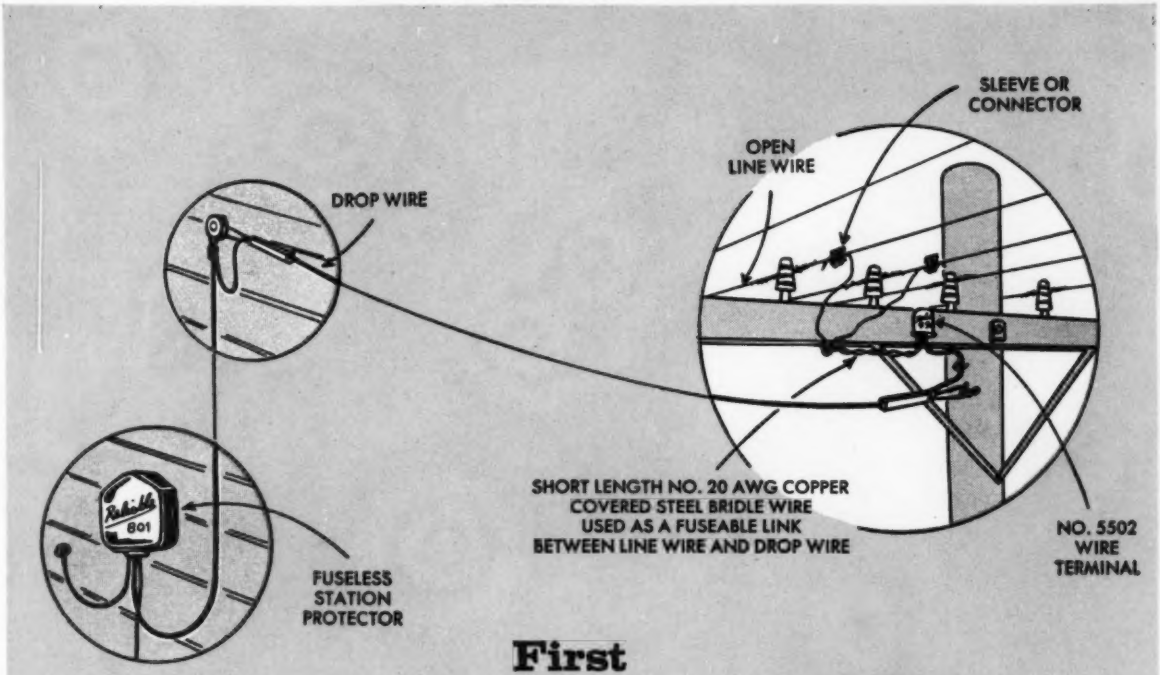
Also on Mar. 8, the commission approved a rate increase for the Brazil and Center Point exchanges of the Citizens Telephone Co. of Clay County, Brazil, effective Apr. 1.

The Citizens company was authorized to raise its rates by a gross amount of $58,669 annually.

The rate increase was withheld from the company's Clay City exchange pending improvements in equipment and service.

The rates are as follows:

Brazil:	*Old*	*New*
One-party residence	$2.75	$4.00
Two-party residence	2.25	3.25
Five-party residence	2.00	2.50
One-party business	5.25	6.50
Two-party business	4.25	5.50
Rural multi-party residence (within 3 miles of exchange)	2.00	2.50
Rural multi-party business (within 3 miles of exchange)	3.25	4.00
Center Point:		
One-party residence	2.25	3.00
Four-party residence	2.00	2.50
Rural multi-party residence	2.00	2.25
One-party business	3.50	4.75
Rural multi-party business	3.00	3.25


SLEEVE OR CONNECTOR
OPEN LINE WIRE
DROP WIRE
SHORT LENGTH NO. 20 AWG COPPER COVERED STEEL BRIDLE WIRE USED AS A FUSEABLE LINK BETWEEN LINE WIRE AND DROP WIRE
NO. 5502 WIRE TERMINAL
FUSELESS STATION PROTECTOR

ADVANTAGES

- People and Property are Safer—Abnormal Currents are Grounded
- No Fuse Troubles
- Air Gap Sealed Against Dirt and Moisture
- Low Maintenance Cost
- Insect and Weather Proof
- Small, Neat, Easy to Install

First Fuseless Protectors UL Approved for use with OPEN WIRE

Reliable Fuseless Station Protectors are now approved by Underwriters' Laboratories for use on circuits connected to open wire (see National Electric Code, article 800, current edition). This is in addition to the four year old approval for use with circuits from cables having metallic sheaths or shields.

All Reliable Fuseless Station Protectors employ self-contained No. 504 Protector Units with low cost replaceable elements.

Write for literature on Reliable Fuseless Station Protectors

No. 700

No. 801

No. 800

Reliable ELECTRIC COMPANY • FRANKLIN PARK, ILL.

A HALF CENTURY OF SERVICE TO THE UTILITIES

A TELEPHONE CALL IS A GREAT BIG SMILE

Telephone service can't be seen or touched, wrapped in cellophane or sold by the pound. But just as the unseen wind sets leaves to rustling, a telephone call brings a sparkle to the eyes and a smile to the face.

Like this little girl's. That radiant grin will brighten the pages of many national magazines this month and next in a long distance advertisement called "Listen to her smile."

This merry message on the sheer fun of telephoning should stimulate calling for the entire industry.

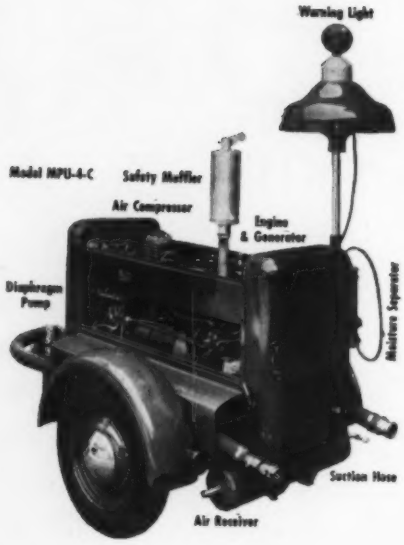
BELL TELEPHONE SYSTEM

YOU CAN HAVE

S&G

A POWER AND PUMPING PLANT

THAT GOES ANYWHERE



MOBILE POWER UNIT

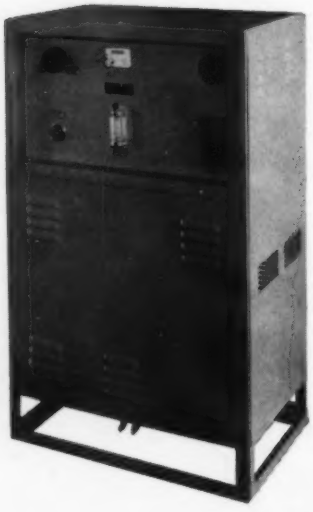
- Generator slow speed for quietness
- Pump—Diaphragm type to remove seepage and drain back
- Air Compressor — to put cables under pressure for cutovers or repairs

  Furnished with or without pump and compressor
- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cutovers, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
- light, easy to handle

MODEL A Air Compressor Dehydrator

Exchange equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 30 cables. The unit is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.

- **Completely automatic in operation**
- **Air Purifier to eliminate oil mist**
- **Incorporates the latest safety devices**



write or phone

S & G MANUFACTURING CORPORATION
P. O. Box 1309 • New Orleans 10, La. • JAckson 5-3142

SMALL COMPANIES

Concluded from page 22

might not be economical to have a story of this type in printed form in the smaller company, but if it is given verbally by means of a check list to ascertain that all points have been covered, the results should be the same and may be better understood by the newcomer.

Periodic discussions by supervisors and others which cover all operating problems, including rates and public relations will, if incorporated in a well-planned training program, result in trained employes who will be in a position to adequately handle the customer's problems in the course of their daily duties. These meetings will also permit a more accurate valuation of each employe which might be more difficult to secure from other sources.

The actual setting-up of a training program which would be applicable to the smaller exchange may be looked upon as a job requiring the services of those engaged in the field of higher learning.

Actually, the owner or manager of the smaller company can, without too much effort, compose a program which will adequately fill the requirements. The big problem is to marshal the effort to set it up and then follow through by using it as an accepted phase of the company operating plan.

The determination of whether or not the plan is producing the desired results is like advertising—you cannot just go out and weigh or count the results. Further, the effects of the program will, for a period, be non-existent or of a very minor nature. They might begin to be evident in connection with a rate hearing or in the customer's verbal or written comments which are so often received regarding service.

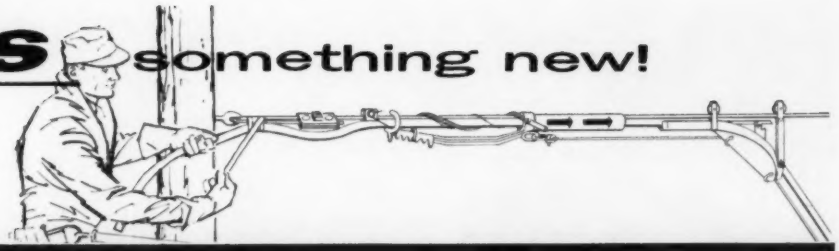
In any event, it will take some time before the results of the training program show up, but just so long as you start to get the customer thinking that the telephone company is a regulated industry operating for the combined benefit of the subscriber, investor and the employe, not to mention the general public, then you have a good start along the road toward public education regarding a very vital service which is destined to grow in leaps and bounds in the future.

(To be continued)

Ariz. Company Gets Rate OK

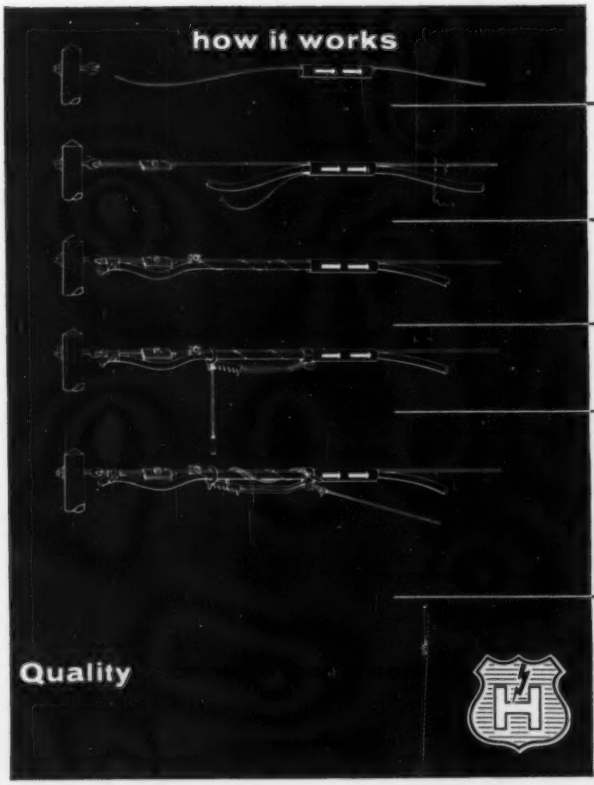
The Western States Telephone, Inc., Holbrook, was granted a rate increase by the Arizona Corporation Commission, it was reported recently.

There *is* something new!



Since the advent of lashed cable and messengers in recent years, this type of construction has grown tremendously in popularity with communication and distribution engineers. The new Hubbard lashing tool and method places the means of accomplishing this task within reach of smaller companies as well as providing a substantial saving to the large ones.

For additional details and ordering data write for a copy of LB-1257, Advertising Department, 6301 Butler Street, Pittsburgh 1, Pa.



Slide tube containing pre-coiled lashing wire over messenger before it is tensioned making sure that arrows on the tube point toward where the lashing is to be completed.

Insert the cable end as shown and draw the loose *front* end of the lashing wire back through the coils. It is presumed that the proper length of lashing wire has been determined.

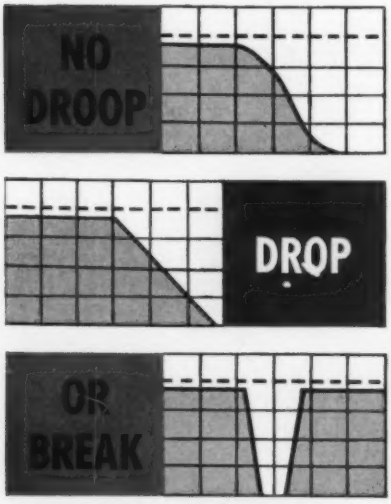
Move the tube in the direction of the arrows about 18 inches to leave room for the Lasher. Fasten lashing wire to messenger with No. 9000 clamp, and tape or otherwise secure the cable end.

Apply Lasher so tube is properly seated. Lasher should be with towing ring in "down" position and adjacent to tube.

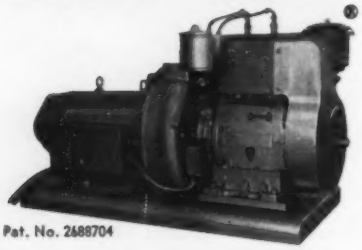
The tensioning spring should now be adjusted for a tight lash, but not so tight as to interfere with the smooth movement of the Lasher. To accomplish this, place the tensioning spring loop in notch nearest towing ring for large cable or in the notch at the opposite end for small cable. Following the diagram, bring the tensioning spring up in back of the messenger and cable as shown,then toward you over the top, down in front, under and around the back again to the attachment hook on the cup of the Lasher.

HUBBARD ***and Company***

PITTSBURGH, CHICAGO, OAKLAND, PLANO TEXAS



in Communications with U. S. MICRO-POWER



Pat. No. 2688704

Your Insurance Policy for . . .

Stable
Continuous
Uninterrupted

Communications Power

Micro-Power operates *with* the main source of power. No time consuming "load transfers." No "power outages" *even for precious seconds!*

Micro-Power Units are available in 1500, 3000, 5000 and 10000 watt capacities. For complete information, specifications, and demonstration, write . . .

UNITED STATES MOTORS CORPORATION
LIGHT US POWER
OSHKOSH · WISCONSIN

U. S. MOTORS CORP.
102 W. 5th Avenue
OSHKOSH, WISCONSIN

ECONOMIC SELECTION STUDIES

Continued from page 28

long distant times in the future. Ten years might be taken as an average maximum.

Some of the present worths will be for charges of the same amount every year, i.e., annual charges. Other present worths will be for items such as lump sum depreciation which occurs only once, or such as non-recurring expenses. These might be costs of shifting poles, relocating equipment in a central office, trimming trees along a pole line, etc.

The addition or removal of plant items at a future date changes the total amount of the annual charges, so that they are different than before the addition or removal. The effect of the removal upon the economy of the plan is important. The impact of these changes occurring at various times can only be measured by reducing them all to a common date (now) in all plans, i.e., to present worths.

The annual charges are converted into a present worth by multiplying by a factor from Table 11, paragraph 3.600 (Part 3 of series, TELEPHONY, Mar. 22). Lump sum depreciations and non-recurring expense items are converted into present worths by multiplying by a factor from Table 8, paragraph 3.300.

6.200 *Present worth study diagrams.*

6.210 Economic selection studies of the present worth type usually involve items of different assumed service lives within the period of the study. It is much easier to visualize the part played by each item, if diagrams are made showing the position of the separate items of each plan with respect to the beginning and end of the study period.

The diagram also aids in obtaining the solution to study problems by presenting pictorially each component part of the study and by giving some means of checking that all parts have been included in the computations. This is particularly true in the case of complex study plans involving many different items in each plan. See *Table 13.*

6.220 The possible conditions encountered in present worth studies are indicated in the diagram above. The horizontal lines represent annual charges to be paid from the beginning of the study period (0 years, i.e. now) until the removal of the item. If the item is to be removed during the study period, the removal is indicated by a short diagonal line. When the item is not to be removed during the study period, its continuance in service is indicated by an arrow pointing into the future at the right.

Lines beginning to the left of the "0" date represent annual charges paid in the past; those extending to the right of the "0" date line represent annual charges to be paid in the future. If the horizontal line extends beyond the end of the period, then those annual charges occur beyond the range of the study.

Only the charges occurring at the beginning, within, or at the end of the period are taken into account. Charges occurring before the beginning of the period or after the end of the period are ignored.

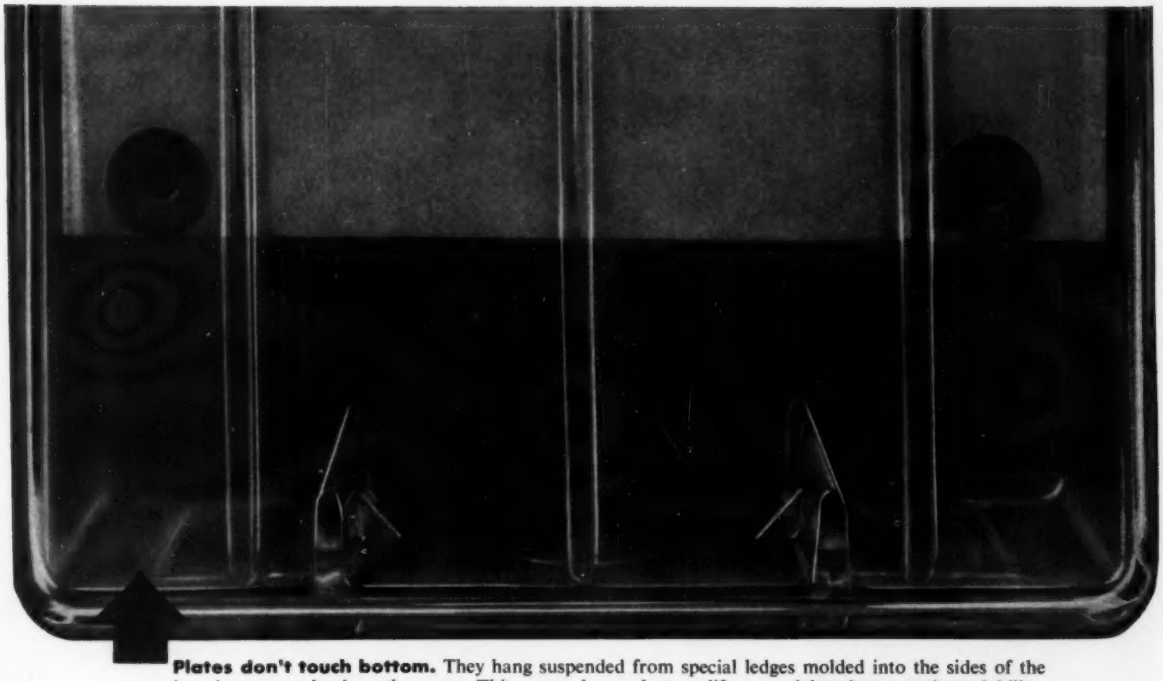
6.230 *Deferred annual charges.* All annual charges, lump sum depreciations, and non-recurring expenses except those in Cases 8, 9, and 10 (Table 13), use factors obtained directly from the indicated tables to convert to present worth. Special factors must be developed to convert the annual charges in Cases 8, 9, and 10.

To determine these factors for deferred annual charges, it is necessary to subtract the factor found in Table 11, for the time between the "0" date (now) and the installation date from the factor for the time the item leaves the study. This latter date may be before the end of the study period, as in Case 8, or at the end of the study period, as in Cases 9 and 10. This method is illustrated in paragraphs 6.545, 6.546, and 6.547.

6.300 *Equated annual charges.* Additions and retirements to existing equipment are often made at intervals of several years. In addition, lump sum depreciations and non-recurring expenses may also be involved at various times during the study period. A study involving such items might give the present worth of the charges of the various units over a period of years, but this would not indicate what constant annual charge would be equivalent to the varied annual charges occurring at different years of the study period.

This constant annual charge is called the *equated annual charge.* It shows what the annual charges would be, if they were the same amount every year. The equated annual charge may be found by several methods, as shown below.

6.310 Assume the annual charges on a series of units installed at different times have been determined. On one of the units the annual charge is $125, beginning at the end of the first year



Plates don't touch bottom. They hang suspended from special ledges molded into the sides of the jar—impose no load on the cover. This means longer battery life potential and greater dependability.

NEW EXIDE-MANCHEX BATTERY ...BUILT FOR EXTRA LIFE

Exide-Manchex positive plate. Active material is built up between the spiral layers of these unique lead buttons that act like tiny shelves. Support it against shedding. Reserve lead prolongs battery life.

In the new Exide-Manchex, plates are suspended from the top—do not touch the bottom of the jar at all. So sediment drops right to the bottom, inches away from the plates. It will never, never cause a short.

This new design feature means that Exide-Manchex now has longer life potential than ever. In addition, the new open design spacer, with high porosity, microporous separator, means lower internal resistance and higher capacity. Greater electrolyte reserve means less frequent watering and assures better voltage.

Get complete information on this stationary battery, the finest you can buy. Write Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®

Dependable Power

for Years-
and Years-
and Years-
of Service!

SCHAUER
ELECTROX

BATTERY ELIMINATORS
BATTERY CHARGERS

In sizes and capacities to meet every telephone power requirement.

See your Schauer Jobber.
Write for Bulletin 1465.

RECTIFIER DIVISION
SCHAUER
MANUFACTURING CORP.
4514 Alpine Ave.
CINCINNATI 42, OHIO

and recurring at the end of each year of a 10-year period.

A second annual charge of $100 begins at the end of the third year and continues annually to the end of the period. A third annual charge of $75 begins at the end of the sixth year and recurs annually to the end of the period. If the cost of money is 7 per cent, what is the equated annual charge?

Diagram

Year	0	1	2	3	4	5	6	7	8	9	10
A.C. 1st item		125	125	125	125	125	125	125	125	125	125
A.C. 2nd item					100	100	100	100	100	100	100
A.C. 3rd item								75	75	75	75
Total A.C.		125	125	125	225	225	225	300	300	300	300

Method I

Annual Charge	*Period, Years*	*Factor*	*Cumulative Charge Table*	*Amount*
$125	10	13.816448	4	$1,727
100	7	8.654021	4	865
75	4	4.439943	4	333
				$2,925

Future worth of annual charges:
Equated annual charge = future worth of annual charges divided by 10-year annuity cumulation factor for 7 per cent (Table 10) = $2.925/13.816448 = $212.

Method II

As in Method I, obtain the future worth of the annual charges. Then the equated annual charge = future worth of annual charges multiplied by the 10-year 7 per cent annuity factor (Table 9) = $2,925 x .072378 = $212.

Method III

Annual Charge	*Period, Years*	*Factor*	*Cumulative Charge Table*	*Amount*
$125	10	7.023582	5	$ 878
100	10-3	4.399266	5	440
75	10-6	2.257042	5	169
				$1,487

Present worth of annual charges:
Equated annual charge = present worth of annual charges divided by the 10-year factor for present worth of an annuity at 7 per cent (Table 11) = $1,487/7-.023582 = $212.

Method IV

As in Method III, obtain the present worth of annual charges. The equated annual charge = present worth of annual charges multiplied by the 7 per cent 10-year factor for annuity of a present worth (Table 12) = $1,487 x .142377 = $212.

6.400 *Present worth study data sheets.*

6.410 For making present worth studies, the form on p. 24 has been found very satisfactory. *See Table 14.*

The headings at the top of the sheet are self-explanatory, as are also the column headings. However, the data which is placed in each column may require some explanation.

Several types of information are placed in the column headed "Item." In this column is placed the name and usually the amount of an item, as "2000' aer. cable" or "53 poles."

Lump sum depreciation (LSD) is another entry which is made in this column. This may appear as "aer. cable LSD $3200."

The third type of information placed in this column is non-recurring expenses, such as "relocating frames $2,000." When the maintenance is indicated in dollars rather than as a per cent of the first cost, it is also shown in this column, thus "mtce., poles." It will be noted that only the entries for lump sum depreciation and for non-recurring expense show a dollar amount in this column.

The column headed "Investment" carries the investment or first cost of each item, such as for the 2000 feet of aerial cable or the 53 poles shown in the Item column. These items include existing plant to be retained as well as proposed plant.

The "Annual Charge Per Cent" column bears the total of the percentages listed at the bottom of the form for the particular item of plant involved.

The "Annual Charge Amount" column contains the product of the investment by the corresponding per cent. In this latter column is also placed the

maintenance annual charge, when expressed in dollars per year.

When maintenance is expressed as a percentage of the first cost it is included with the other percentages in the Annual Charge Per Cent column.

In the "Period" column are shown the year the item enters the study and the year the item leaves the study. If the year of entrance is "0" (now), the "0" is usually omitted.

In the "Table" column is entered the table number from which the figure in the "Factor" column is obtained.

The product of the proper figure in the "Factor" column by the "Annual Charges Amount" is the "Present Worth Amount" entry. The product of the appropriate figure in the "Factor" column by the amount of the lump sum depreciation or of the non-recurring expense in the "Item" column is the "Present Worth Amount" entry for those types of charges.

Near the bottom of the form is a line labeled "Total." This line is used only for showing the total present worth in the "Present Worth Amount" column. Entries in any of the other columns on this line are meaningless, particularly in the "Investment" column, as the investments are seldom all made at the "0" date.

To be of some import, investments should be converted from a figure at their actual date to an equivalent amount at the "0" date. This work will be outlined in paragraph 6.620.

6.420 One or more such forms may be necessary for each plan of a present worth study. The total present worth of all charges is found for each plan, and these totals are compared to discover the plan having the smallest total. This plan is the most economical plan for the period of years covered by the study.

6.500 *Examples in determining present worth.*

6.510 Suppose the present worth of the annual charges over a 10-year period is to be found on an item of equipment costing $1,200. The annual charge percentages are tabulated in that part of the accompanying form below the solution.

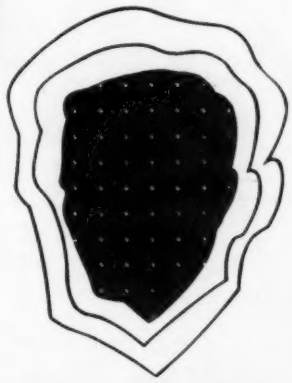
Diagram

(Compare with par. 6.220)

See *Table 15*, page 24.

This means that for the $1,200 item, *today's* value of the annual charges over a 10-year period is $1,967. That

LEARN WITH TTI



NOW a Complete Course
To Train Telephone Technicians
Quickly, Easily, Economically in

Carrier Theory and Operation

For Individuals or Company Classes
BY HOME STUDY OR IN RESIDENCE PROGRAM

through the Telephone Training Institute's Unique Training Program!

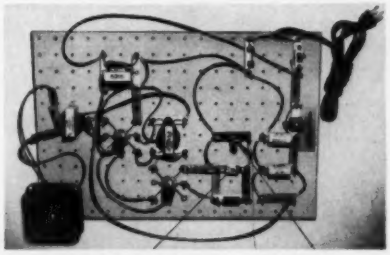
Now, for the first time, a comprehensive course is available to thoroughly train telephone plant personnel. TTI offers complete training from basic electricity and radio theory through advanced telephone carrier techniques. The plan was developed in collaboration with major American telephone companies and telephone equipment manufacturers who have recognized the need of such training for many years. Some previously started their own programs. Now the TTI supplies the technical training saving both time and cost to these concerns.

PERFECTED IN USE!

The TTI program has been tested and perfected by telephone men. The TTI course was put into practice by communications companies to train plant engineers and installation technicians. Many new employees had had no previous electronic experience. TTI training fully qualified them to install, operate and maintain telephone equipment.

TTI TRAINER BOARD

This special training kit is the key by which the student receives practical how-to-do-it experience.
TTI courses are adaptable to any company training program.



ON-THE-JOB-TRAINING

TTI provides complete instructional material and training aids. This makes it unnecessary to remove expensive plant equipment from service.

FACTORY SPONSORED CLASSES are more effective preceded by TTI training

TRAINING SUBJECTS

Review Mathematics Applied to Ohm's Law • Elements of Direct and Alternating Current • General Telephone Theory, Voice Frequency, etc. • Basic Electron Movement and Ohm's Law • D.C. Circuits • Magnetism • Vacuum Tube Theory • Power Supply • Audio Amplifiers • Oscillators • Transistors • Amplitude Demodulation • Multi-vibrators • Intermediate Frequency Amplifiers • Carrier Theory and Operation • Db Levels and Dbm • Filters • Frequency Translation & Modulation • Techniques I on Telephone Carrier • Techniques II on Telephone Carrier • Channels Used • Pregrouping & Modulation Plans • Carrier Supply • Electronic Regulation of Slope & Gain • Test Instruments •

TTI TELEPHONE TRAINING INSTITUTE
Portland 11, Oregon

COMPLETE and MAIL THIS COUPON TODAY!

Telephone Training Institute
P.O. Box 1986
Portland 11, Oregon

Please send me full information about TTI's unique training program.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

If it's TOWERS you need, check ROHN FIRST!

AMERICA'S FINEST COMMUNICATIONS TOWER OF ITS KIND . . . WITH EXCLUSIVE BUILT-IN ECONOMY

√ Reduce Costs

—by getting a tower *specifically for your* job. These towers are suitable for use up to 300 feet guyed—or self supporting to 50-60 ft.! ROHN towers are in daily use for micro-wave, radio and dozens of all type communications requirements throughout the U. S.—at big savings—yet more than do the job! Can be used for a multitude of jobs.

√ Proven design

—get full engineering data to prove superiority. Gleaming, hot-dipped galvanized finish available—stays shiny and new—no painting needed. Design fully tested—proved by thousands of installations. Easily shipped and inexpensively installed. Cross pieces form natural ladder for servicing.

√ Special Towers

—you're invited to submit your requirements. Towers will be built to your specifications if practical. Let us know your needs—ROHN can satisfy them BEST when it comes to towers of this type.

Shown here is a Rohn No. 30 tower used for radio communications by Central Illinois Light Co. Note slim, sleek appearance—takes little space—yet places antenna high into air for good communications.

FREE

Send for new "Specifications & Price" catalog for Rohn Communications Towers. Your inquiry will receive prompt attention. Rohn representatives are coast-to-coast to serve you. Write—phone—wire

ROHN *Manufacturing Co.*

116 Limestone, Bellevue Peoria, Illinois

"Pioneer Manufacturers of TV and Communication Towers of All Kinds."

is, the present worth of the annual charges is $1,967. The annual charges are $280 per year.

Ten yearly payments of $280 each would amount to $2,800, but if today's view of this $2,800 total is to be obtained, each $280 charge or payment must be projected backward to today from the date it occurs, and the sum of these "backward projections" obtained.

While this is being done, the compound interest (i.e., cost of money) is deducted from each $280 for the time when the payment would normally fall due, to the present time.

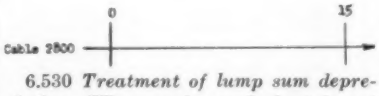
This is all accomplished at once when the $280 annual charge is multiplied by the present worth of an annual charge factor 7.023582.

6.520 *Maintenance as an annual charge per unit of plant.* On some items, maintenance may be given as a dollars-and-cents charge per unit, in which case the maintenance figure will not be expressed as a per cent, but as a separate sum of money. This is illustrated in the following example: (see *Table 16).*

What is the present worth of the charges over a 15-year period on 2500 feet of cable, if the investment is $2,800, cost of money 7 per cent, State property tax 1.80 per cent, federal income tax 4.00 per cent, maintenance $45 per 1000 feet, and annuity depreciation 1.18 per cent?

Total maintenance $45 x 2.5 = $112.50 (i.e. $113).

Diagram



6.530 *Treatment of lump sum depreciation.* When an item of plant is not to be removed as one of the conditions of the study plan, annuity depreciation is used (paragraphs 2.323, 3.412, 6.220) as one of the annual charges.

When the item is to be removed, then lump sum depreciation (LSD) is used. (See paragraphs listed above.) In cases of this kind, the lump sum depreciation is a future expense, not occurring until the item is removed.

This future expense must be converted into a present worth to be included with the other present worths of the plan under consideration.

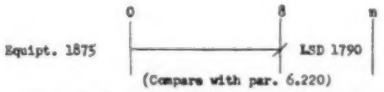
This may be done in either of two ways: (1) by converting the future expense or future worth into a present worth; (2) by converting the future worth into an annual charge and then combining with the other annual charges before obtaining their present worth. Each method is illustrated below. In any plan, depreciation is charged only once against the same item; either lump sum or annuity.

6.531 *Lump sum depreciation as a future worth* to be converted into a present worth. Equipment costing $1,875 may be replaced at the end of eight years, at which time the cost of removal will be $125 with a gross salvage of $210. Annual charges are as shown (see *Table 17).* What is the present worth of the charges?

Since this equipment is to be removed, annuity depreciation is not to be used, only lump sum depreciation occurring at the time of removal.

LSD = $1,875 + $125 — $210 = $1,790 (par. 2.323)

Diagram



It will be noted that part of the charges in this example occur every year. They are the annual charges and are converted into a present worth by a factor from Table 11 for the years and cost of money rate involved. Another part of the charges is the lump sum depreciation which occurs at the date the equipment is removed. In this case, it is eight years from now. This future charge is converted into a present worth by a factor from Table 8.

6.532 *Lump sum depreciation expressed as an annual charge* before converting into a present worth.

For this example, the previously used conditions will be handled again for comparison. The problem will be restated:

Equipment costing $1,875 may be replaced at the end of eight years, at which time the cost of removal will be $125 with a gross salvage of $210. Annual charges are as shown (see *Table 18).* What is the present worth of the charges?

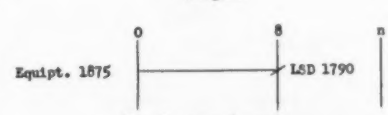
LSD = $1,875 + $125 — $210 = $1,790 (par. 2.323).

Expressed as a per cent of the investment, 1790/1875 = 95.47 per cent at the end of eight years. Change this future worth per cent to an annual charge.

95.47 per cent x .101 (Table 9, 6 per cent column) = 9.64 per cent.

This annual (annuity) depreciation will be combined with the other annual charge percentages at the bottom of the form.

Diagram



(To be continued)

Spring has arrived
and we have contrived
to serve you—

It costs less
and avoids a mess
if you contract
your construction
and engineering,
instead of keeping crews
unoccupied,
for which you must pay,
but
if you contract the service,
you will not
have to pay
for lost time!

GUSTAV HIRSCH ORGANIZATION, INC.
1347 WEST FIFTH AVENUE
COLUMBUS 12, OHIO
Telephone: HUdson 8-0611

from pole to pole... if dependability is your goal

guy with CF&I GALVANIZED STEEL STRAND

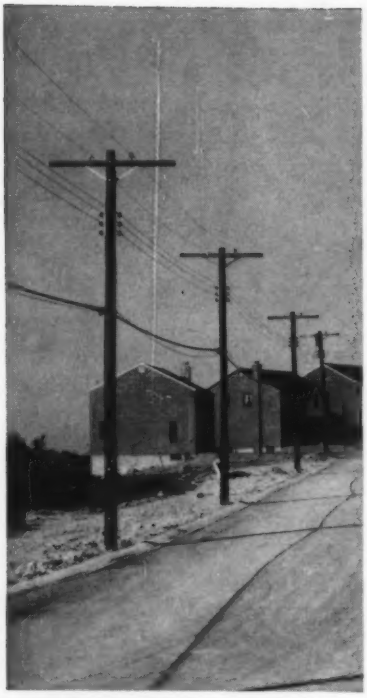
Service conditions demand that guy, messenger and overhead ground wire possess the strength, ductility and corrosion resistance that will assure safe installation and long trouble-free service life.

To meet these requirements, CF&I makes steel that has exactly the right chemical and physical properties. It draws, galvanizes and strands the steel wires into a product that will give years of satisfactory service. Extreme care in cleaning and galvanizing produces a tightly bonded coating of pure zinc that provides maximum protection against corrosion.

CF&I Galvanized Steel Strand meets or exceeds ASTM Specifications A-122 or A-363. If you prefer, it can be made to your specifications in seven- or three-wire constructions. Your nearby CF&I representative or local electrical distributor will give you complete details. Why not call him today? 5672

CF&I GALVANIZED STEEL STRAND
THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Chicago
Denver • Detroit • El Paso • Fort Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • New Orleans • New York • Oakland • Oklahoma City • Philadelphia • Phoenix
Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita



KOPPERS POLES ASSURE A SOUND INVESTMENT

Poles and crossarms constitute a large share of a utility's total investment. That's why it is so important that the poles installed today give maximum service. And you can be sure of lowest-per-year costs when you use Koppers pressure-treated poles and crossarms. Proof of this low-per-year cost is evident in the many millions of Koppers poles set in the past 50 years. So few have been removed that it's impossible to estimate accurately their maximum service life . . . but 30, 40 and 50 years service is not unusual.

One fact is pointed up. Koppers pressure-treated poles and crossarms have the strength and durability required to assure continual low-cost operations decade after decade.

for your information . . .

Write for the 38-page guidebook on pressure-treated poles, crossarms, timbers. It is jam-packed with valuable data.

Wood Preserving Div.
Koppers Company, Inc.
757 Koppers Building
Pittsburgh 19, Pa.

C-9

KOPPERS POLES

REA Announces Latest Loan Allocations

THE Rural Electrification Administration has approved the following rural telephone loans:

St. Matthews (S. C.) Telephone Co., $178,000; Mar. 3.

This loan will finance improved service for 183 existing subscribers and initial service for 84 farm families. The current subscribers are now receiving magneto service from the Cameron Telephone Co., whose facilities the borrower proposes to acquire with loan funds and its own general funds.

A new automatic central office is scheduled at Cameron. Three REA loans totaling $457,000 to date will make it possible for the borrower to provide new and improved service for 1,083 rural subscribers. The completed system will consist of three exchanges of which Creston and St. Matthews are in operation serving approximately 800 subscribers.

G. M. Northington is president and R. F. Nickels is manager of the St. Matthews Telephone Co.

•

Hendricks Telephone Corp., Clayton, Ind., $522,000; Mar. 7.

The new borrower proposes to use the loan funds to improve service for its 904 existing subscribers and to furnish initial service to 577 farm families. The borrower now provides magneto service through its Clayton, Hazelwood, New Winchester, and Stilesville exchanges.

A new automatic central office is scheduled in the rural area south of Clayton which will serve the Clayton, Hazelwood, and Stilesville communities. This will be known as the Hendricks exchange. The New Winchester community, which is in a noncontiguous area, will be deleted from the system.

Garland B. Foscue is president and manager of the Hendricks Telephone Corp.

•

Vandalia (Mo.) Telephone Company; $577,000; Mar. 7.

The new borrower plans to improve service for its 1,258 current subscribers and provide initial service to 151 farm families.

A new automatic central-commercial office building is scheduled at Vandalia. A small portion of the loan funds will refinance the borrower's indebtedness incurred in improving the present system.

Wayne Scott is president and manager of the Vandalia Telephone Co.

•

Marianna & Scenery Hill Telephone Co., Marianna, Pa.; $523,000; Mar. 7.

This loan will finance improved service for 870 existing subscribers and will furnish initial service to 447 rural subscribers. At present, the company consists of a magneto exchange at Marianna and automatic facilities at Scenery Hill.

New construction scheduled includes a combined automatic central-commercial office building in Marianna. The present automatic facilities at Scenery Hill will be enlarged and retained in the expanded system. A portion of this loan will refinance the borrower's existing indebtedness incurred in modernizing the Scenery Hill exchange.

Russell J. Horne is president and manager of the Marianna & Scenery Hill Telephone Co.

•

Sherwood (O.) Mutual Telephone Association, $35,000; Mar. 10.

With its two REA loans totaling $182,000, the borrower will be able to furnish new and improved service to 506 rural subscribers The Sherwood exchange will be converted to automatic operation.

Enos Bok is president and Laton W. Teegardin is manager of the Sherwood Mutual.

•

Caldwell County Telephone Co., Martindale, Tex.; $226,000; Mar. 10.

The borrower plans to acquire the Bastrop Telephone Co., consisting of magneto exchanges at McDade and Paige. The Bastrop company now serves 186 subscribers.

New automatic central offices are scheduled to replace the two existing magneto central offices. The new construction and rehabilitation will enable the Caldwell company to provide initial service to 214 farm families and to improve service for the 186 existing subscribers.

The two REA loans to this borrower, totaling $620,000, will enable it to furnish new and improved service to 1,166 rural subscribers.

L. D. Ware is president and Tyrus A. Bordelon is manager of the Caldwell County Telephone Co.

Obituaries

MARSHALL V. ROBB, 79, retired Independent telephone company owner and executive, died at his home at Cape May, N. J., on Mar. 5.

Mr. Robb was a native of Bainbridge, O.; however, he moved to Clinton, Ind., at an early age and was reared and spent most his life at Clinton. He attended local schools at Clinton and Wabash College at Crawfordsville.

Early in his business career he entered the public utility field. He was one of the organizers of the Wabash Valley Electric Co., later sold to the Public Service Co. of Indiana, of which he was, for some years, a vice president. In the public transportation business he owned and operated the Allentown & Reading Transit Co. from 1928 until 1943 with general offices at Reading, Pa.

Up until several years ago, Mr. Robb owned and operated the West Newton (Ind.) Telephone Co. and the Consolidated Telephone Co. of Florence, Ky.

In 1948, Mr. Robb retired from active business connections and moved to Cape May, N. J. where he had occupied a summer home for many years.

Mr. Robb is survived by his widow and three daughters, Mrs. Katherine R. Miller of Cape May; Mrs. Jane R. Chittick of Paris, Ill., and Mrs. Mary R. Trexler of Allentown, Pa. Seven grandchildren and one great-grandson also survive.

•

D. C. GALASSI, chairman of the board of Automatic Electric, S.A.T.A.P., Milan, Italy, a subsidiary of General Telephone Corp., died at his home in Rome, Italy on Mar. 9, following a prolonged illness.

Mr. Galassi had been associated with the Automatic Electric group for more than 30 years and was managing director of the Italian affiliate from 1937 to Dec. 14, 1956, when he was elected chairman of the board.

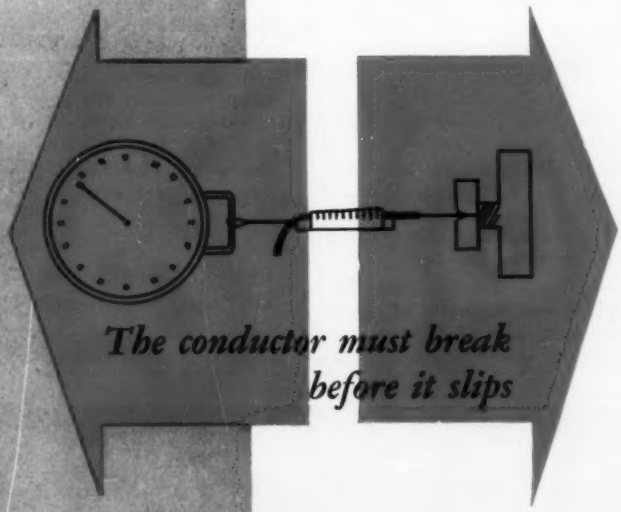
In 1953, Mr. Galassi was awarded one of Italy's highest honors, "Commendatore al Merito della Republica," "Commander of the Order of Merit of the Republic."

He joined Automatic Electric Co. in Chicago in 1926 after six years with Western Electric Co. and Bell Telephone Laboratories.

He is survived by his wife, Ethel, a native of Minnesota, a son, Nelson, who is employed by Automatic Electric Sales Corp., Northlake, Ill., and a daughter, Karen, a student at Radcliffe College, Cambridge, Mass.

ALPHADUCT

P clamp adhesion test



P clamps are the most widely used method of attaching drop wire to buildings. Lest you may worry about a P clamp causing slipping of the insulation or jacket on Alphaduct Neoprene Jacketed Drop Wire — read about this Alphaduct service test. This test is made daily.

A sample of Alphaduct wire is inserted in a P clamp with 12 inches of the wire projecting from the top of the clamp. The bail of the clamp is then inserted in the upper jaws of a tensile testing machine, and the end of the wire is stripped free of jacket and insulation and inserted in the other end of the machine.

The jaws of the machine are then gradually separated until the conductor breaks. The conductor must break before there is ANY slipping of either the jacket or the insulation.

Don't have any worries about a little old P clamp hurting ALPHADUCT drop wire. Try Alphaduct. It's dated by a color coded thread so you can see for yourself how long it lasts, how much money it saves.

ALPHADUCT WIRE AND CABLE COMPANY • NEW BRUNSWICK, N. J.

NATIONAL DISTRIBUTORS • AUTOMATIC ELECTRIC SALES CORP., NORTHLAKE, ILL.
LEICH SALES CORPORATION, CHICAGO, ILLINOIS

REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO., CHARLOTTESVILLE, VA.
THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

REA Names New Chief For Telephone Loans

The appointment of William S. Rummens of Seattle, Wash., as assistant administrator of the Rural Electrification Administration in charge of telephone loans was announced on Mar. 7 by the U. S. Department of Agriculture.

David A. Hamil, REA administrator, named Mr. Rummens to succeed J. K. O'Shaughnessy, who retired from government service last September.

For the past year, Mr. Rummens has served as enginering coordinator and a member of the weapons system change board in the pilotless aircraft division of Boeing Airplane Co., Seattle. Prior to that he was senior telephone engineer on the staff of the Washington State Public Service Commission. His service with the commission began in 1948.

Mr. Rummens started his telephone engineering career in 1935 in the plant department of the Pacific Telephone & Telegraph Co. at Olympia, Wash. He remained with Pacific T&T until 1948, except for the period of 1939-1946 when he served with the U.S. Navy.

During World War II, he served as engineering and electrical officer both on underwater and surface craft. He was electrical officer on the USS Hornet when the aircraft carrier was sunk in the Battle of Santa Cruz. Later he was assistant maintenance officer on the staff of Admiral William F. Halsey, commander, South Pacific. He was awarded 13 battle stars for sea duty in the South Pacific and received a commendation for performance of duty in action.

Mr. Rummens was born in Seattle and attended the University of Washington.

N. C. Company Elects Tilden Vice President, Director

At the recent stockholders meeting of the North State Telephone Co., High Point, N. C., Thomas A. Tilden was elected a vice president and a director of the company.

At this meeting, Robbins Tilden, secretary-treasurer and general manager, reported that North State had a net gain of 1,741 telephones in 1957. The company operates exchanges at Thomasville and Randleman as well as High Point.

Two in Ohio Name C. L. Haas To Supervise Merchandising

Carl L. Haas, who retired recently after 36 years of service with the Ohio Bell Telephone Co., at Cleveland, has joined the Elyria (O.) Telephone Co. as merchandising supervisor. He will have charge of employe general and sales training relative to public relations. He will also serve the Western Reserve Telephone Co., Hudson, in a similar capacity.

C. L. HAAS

Mr. Haas served in a wide variety of supervisory positions in the plant department of the Ohio Bell Telephone Co., Cleveland. He was staff supervisor of public relations and merchandising when he retired.

Safety Council Offers Two New Booklets

The National Safety Council has two new publications available for industry—one for employes, the other for foremen.

The publications are "Rules for Safety" and Book 8 in a series of "Five Minute Safety Talks for Foremen."

"Rules for Safety," the Council says, is the "biggest and best safety rules booklet ever compiled—40 pages covering accident prevention do's and don'ts, how's and why's." The booklet gives safety rules for using power tools, stacking material, and lifting and carrying.

The book of safety talks for foremen is a compilation of talks that appeared in earlier books in the series. The 52 talks in Book 8, the Council says, "provide full and balanced coverage of all the major types of occupational accidents."

Talks in Book 8 range from "Why We Have a Safety Program" to "Bumping into People and Things."

Free copies of descriptive brochures on these books are available from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

TAKE A BIG STEP TOWARD SAFETY WITH DUO-SAFETY LADDERS

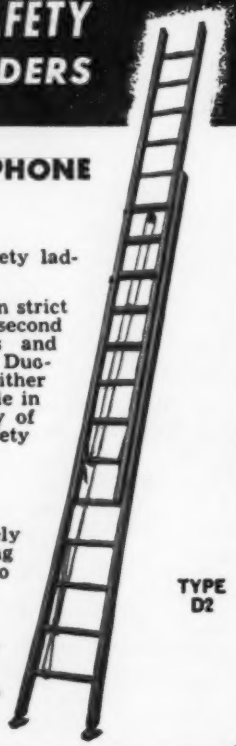
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



TYPE D2

For Information, Contact Your Supply House, or

DUO-SAFETY LADDER CORP.

809 Ninth Street • Oshkosh, Wisconsin

30 Day Free Trial Offer!!

The All New Terminating Board Model TBZ

for use with the Murphy Cable Tester

We'll gladly send one TBZ Terminating Board to each division or area for a 30 day free trial. No obligation! If you don't see that the fabulous TBZ will *save you money, save hours of time, is simpler to use,* and *has a wider variety of uses,* send it back in 30 days and there will be no charge.

TBZ's simplified construction uses only ten standard binding posts instead of 20 special ones . . . ten slots instead of 101 holes as in standard tag-boards. No holes to thread wires through. Lay them speedily in ten clearly numbered slots.

Only $25 each. Greater savings when ordered in quantities. Write for additional information on the TBZ as well as a complete brochure of all Murphy products for the telephone industry.

ELECTRONIC RESEARCH DEVELOPMENT MANUFACTURE

MURPHY
ENGINEERING LABORATORIES, Inc.

4419 Tulsa Houston 24, Texas

For Your ENGINEERS

★ ★

THE ANALYSIS AND PRESENTATION OF ENGINEERING PROBLEMS
(In Two Volumes)

By HARRY C. WALKER, B.S., C.E., Ph.D.
Plant Training Supervisor, Southern Bell Telephone & Telegraph Co.

Volume I is a simple yet comprehensive treatment of the normal thought process applied to engineering problems. This volume also sets forth the principles of logical analysis in the light of emotional bias and other disruptive factors and explains how these may be applied, in writing, to engineering presentations.

Volume II is essentially an English handbook, written particularly for engineers. Using the decimal reference system, this book permits easy and rapid reference in the "language problems" of the engineer.

PRICE: $2.50 PER SET
SEPARATE VOLUMES: $1.50 EACH

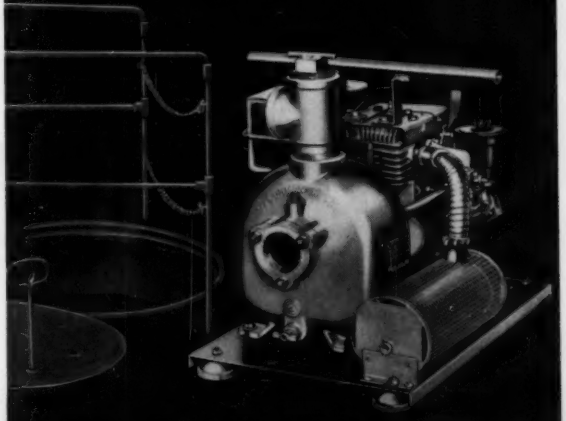
ORDER FROM

TELEPHONY PUBLISHING CORP.
608 SOUTH DEARBORN STREET CHICAGO 5, ILL.

Note: We also distribute Dr. Walker's other books:
ORAL EXPRESSION IN SUPERVISION
THE FUNCTIONAL ELEMENT IN SUPERVISION
THE HUMAN ELEMENT IN SUPERVISION
OFF JOB TRAINING

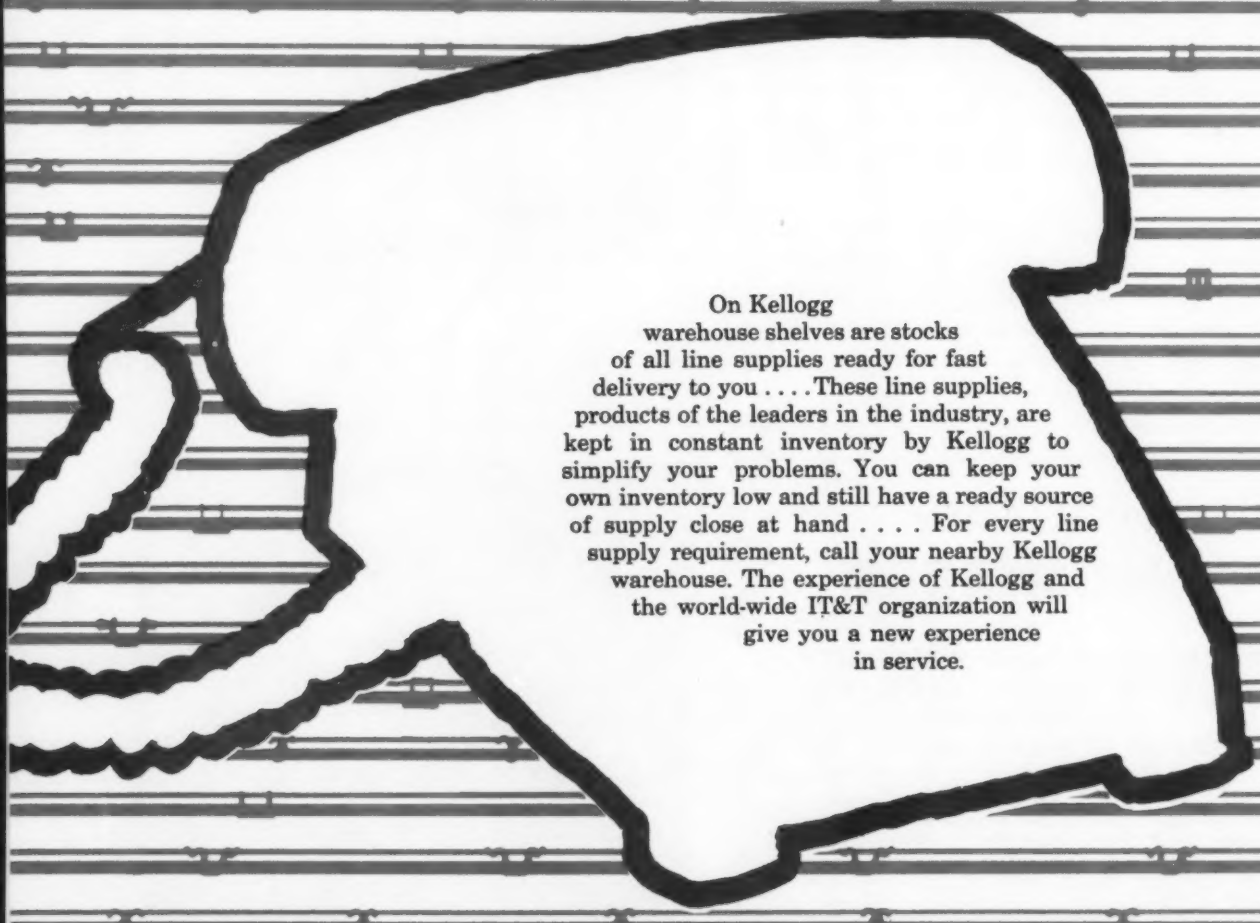
GORMAN-RUPP DEWATERING PUMPS

equipped with muffler and hand throttle for quiet zones



THE GORMAN-RUPP COMPANY
Mansfield, Ohio

You can solve your stock inventory at Kellogg



On Kellogg warehouse shelves are stocks of all line supplies ready for fast delivery to you . . . . These line supplies, products of the leaders in the industry, are kept in constant inventory by Kellogg to simplify your problems. You can keep your own inventory low and still have a ready source of supply close at hand . . . . For every line supply requirement, call your nearby Kellogg warehouse. The experience of Kellogg and the world-wide IT&T organization will give you a new experience in service.

KELLOGG

A DIVISION OF

KELLOGG IT&T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

6650 S. Cicero Ave., Chicago 38, Ill.

Telephone: POrtsmouth 7-6900

KELLOGG Warehouses and Offices:

5924 S. Pulaski Rd.
Chicago 29, Illinois
REliance 5-7740
TWX: CG-3296

4501 Truman Road
Kansas City 1, Missouri
HUmboldt 3-7085
TWX: KC-686

6100 Excelsior Blvd.
Minneapolis 16, Minn.
WEst 9-6715-6
TWX: MP-1195

1555 West Fourth Street
Mansfield, Ohio
LAfayette 4-6511
TWX: MANS-0-132

1515 Turtle Creek Blvd.
Dallas 7, Texas
Riverside 7-5191
TWX: DL-02

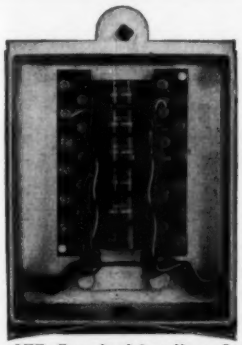
165 Prospect Street
Passaic, New Jersey
PRescott 9-3610
TWX: PAS-1067

23 Broderick Road
Burlingame, California
OXford 7-5780
TWX: SAN MATEO-06

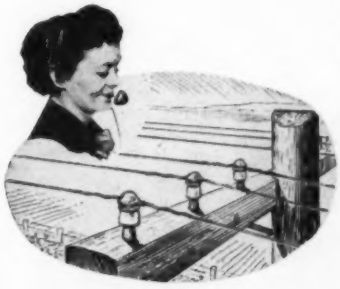
1594 Southland Circle, N.W.
Atlanta, Georgia
Sycamore 4-2441
TWX: AT-351

Kellogg's Standard Outside Plant Handbook now available at special price while quantities last. Reduced to $2.75 a copy, with ten or more copies priced at $2.50 each. Every phase of outside plant telephone pole line construction is covered in book.

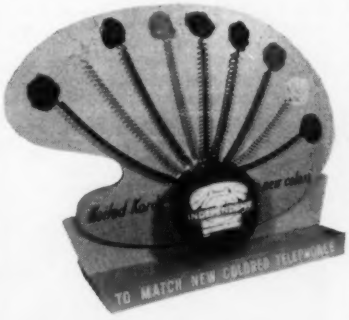
Crapo Pretied Splints can be attached to insulator on the ground. Easy to install. Save time and labor. Permit resagging line wire without removing tie wire. Produced for galvanized steel and copper/steel telephone line wire. INDIANA STEEL & WIRE COMPANY, INC.



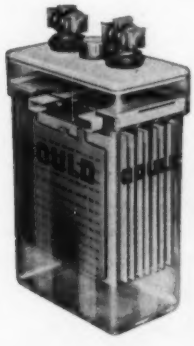
Type 177 Terminal-Loading Case. A cast aluminum combination terminal box and housing for loading coils. For use with the new rural distribution wire for 6, 11 and 16-pair capacity. Available in 8 types. Terminals, available with or without protectors, accommodate loading coils of 88MH or 44MH inductance. COMMUNICATION EQUIPMENT & ENGINEERING CO.



Copperweld Talks Better than any other high-strength conductor. Strong, nonrusting, easy to string, it's unequalled for long-life, long-span construction. Use .080"—30 E.H.S. for short subscriber loops and secondary toll lines—and .104"—40 H.S. for toll lines and long subscriber loops.
COPPERWELD STEEL CO.



Koiled Kords—Customer satisfaction and long service life are assured with Koiled Kords retractile telephone cords. Black and colored cords in standard and extra lengths are available for replacement purposes and for use on new equipment. Made by KOILED KORDS, INCORPORATED.

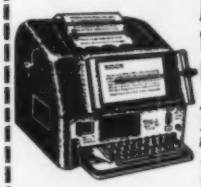


Outstanding Battery Performance is yours when you choose Gould Plante' Batteries. Thick, grooved, pure lead positive plates give many years of trouble-free service! Made by GOULD-NATIONAL BATTERIES, INC., the finest money can buy.

Cook Cable Coat eliminates need for taped splices or potting, and can be provided with selective pair protection. Terminal blocks for making cable conductor taps are filled with plastic resin. Cutting and splicing are eliminated, and connections are made by tapping onto specified conductors. COOK ELECTRIC COMPANY.

For Decimonic Ringing Systems—The K-5 Subcycle supplies permanently accurate ringing frequencies and closely regulated ringing voltages. Requires little power to operate and minimum maintenance.
LORAIN PRODUCTS CORPORATION.

TELETYPE



AMERICAN TELETYPE PARTS CORP.

A specialized source for Teletype Equipment and Parts with over a decade of dependable service.

We maintain large inventories of the following reconditioned like new and new equipment. Machines are altered to meet your specifications.

MODEL 14
MODEL 14 TYPING REPERFORATOR
MODEL 15
MODEL 19
TRANSMITTER DISTRIBUTORS
RECTIFIERS
RELAYS

We also stock a large parts inventory to meet your specific replacement needs.

Our prices are competitive and in most cases present considerable savings. We accept trade-in units under most favorable terms and are open to purchase any excess inventories.

ALL INQUIRIES PROMPTLY ANSWERED

AMERICAN TELETYPE PARTS CORP.
23 PARK PLACE • NEW YORK 7, N. Y.
Phones: COrtlandt 7-2575-6-7

MAGNOLIA GLAYZIT
Telephone Refinisher
POLISHES

Cleans, revitalizes, preserves the surface! Dustproof—polish can't come off on cloth when dusting. Only dust comes off! Restores cabinet-maker's finish to furniture! Adds years to life of any finished surface! Supreme for telephones.

MAGNOLIA CHEMICAL CO., INC.
CHICAGO • LAFAYETTE, INDIANA
ATLANTA • DALLAS • LOS ANGELES

Distributed by
LEICH SALES CORP.
427 WEST RANDOLPH STREET
CHICAGO 6, ILL. • RAndolph 6-5441

Named to Assist United's Connecting Company Agent

Miss Phebe E. Burroughs has been named assistant connecting company agent for the United Telephone Companies, effective Apr. 1. She will be assistant to Don Childers, connecting company agent and her office will be located in Kansas City, Mo.

PHEBE BURROUGHS

Miss Burroughs is transferring to Kansas City from the United Telephone Co. of Missouri where she has been auditor of receipts and in charge of the revenue accounting office at Warrensburg, Mo., a position she has held since January 1954.

Miss Burroughs has been continuously employed in the telephone business since 1935, at which time she was employed as toll billing supervisor by the Iowa State Telephone Co., Newton. She held this position for eight years. For four years prior to 1947, she was an accountant for the same company.

In 1947 Miss Burroughs was named general auditor of the Central Missouri and Arkansas Associated Telephone Cos.' and transferred to Warrensburg. She held this position until these companies merged with the United System in January 1954.

As assistant connecting company agent, Miss Burroughs' duties will embrace connecting company problems throughout the 15-state operations of the United System.

AE International Transfers Two Staff Members

Gene K. Beare, president, Automatic Electrical International, has announced the transfer of two staff members, effective Mar. 1.

Michael S. Bonny, staff engineer in the carrier and radio division at Northlake, Ill., has been transferred to Auto-

DRIVE AND RECLAIM GROUND RODS
with
Impact-O
GROUND ROD DRIVER

Needed and used by every line crew. Drives and reclaims ground rods in any type of soil with less work, in less time and with complete safety. Standard duty model drives ⅜" rods. Specially made for telephone company crews and similar operations. Heavy duty model is best for driving ½" rods. Inexpensive, safety approved tools—once used you'll never be without them! Impaction of the barrel on the shank drives the rod into the ground to any desired length.

Standard Duty $19.95
Heavy Duty $21.95
F.O.B. Lake City, Iowa

15 DAY FREE TRIAL OFFER ON REQUEST

ENGINEERS TOOL CO.
116-118 West Main St.
LAKE CITY, IOWA

Stewart

TEST EQUIPMENT

Locates Trouble FAST

MODEL A—Locator-Tester
MODEL D-1—Midget Detecto-Meter
MODEL E—Exploring Coil Amplifier
MODEL G —Dual Electrolysis Voltmeter
MODEL H—Lineman's Test Set
MODEL J—Transistor Oscillator
MODEL L—Cable Tester

STEWART BROTHERS
Division of Instrument Laboratories
Chicago 10, Illinois

matic Electric de Mexico. William E. Ploeger, former export district manager, will replace Bonny.

Mr. Bonny was educated in Turkey, India, England, and the United States. He received his degree in communications from the University of London

M. S. BONNY

in England and has done graduate work at Northwestern University. As a result of his extensive travel in Europe and the East, he speaks French, Spanish, Italian, Greek, Turkish and English fluently.

Mr. Bonny began his association with Automatic Electric in November 1953 when he joined Automatic Electric,

W. E. PLOEGER

S.A.T.A.P., in Milan, Italy. In January 1955, he transferred to this country as an equipment engineer and was soon advanced to the position of staff engineer.

Mr. Bonny is a registered professional engineer in Illinois, an associate member of the American Institute of Electrical Engineers and a member of the Institute of Radio Engineers.

William E. Ploeger, a native of Evansville, Ind., is a graduate of Purdue University and has been associated with Automatic Electric for nine years. He is an associate member of the American Institute of Electrical Engineers and the Western Society of Engineers.

Stromberg-Carlson Names Missouri Representative

Edgar R. Sears Jr. has joined the Kansas City branch of Stromberg-Carlson, a division of General Dynamics Corp., as a territorial telephone sales representative.

He will serve Independents throughout the state of Missouri, under the direction of R. F. Fairly, branch manager.

E. R. SEARS JR.

The announcement was made on Mar. 5 by T. C. Thompson, general sales manager of Stromberg-Carlson's Telecommunication Division.

Mr. Sears joined Stromberg-Carlson in early 1955 from a sales position with the Kellogg Switchboard & Supply Co., Chicago. Prior to that he was a field engineer with the Pacific Gas & Electric Co., San Francisco, and worked for several years in retail sales in that city.

Mr. Sears served 3½ years in the U. S. Army. More recently he represented Stromberg-Carlson in southern California, southern Nevada, and Arizona for the San Francisco branch office.

US Instrument Corp. Holds School for Telephone Men

United States Instrument Corp. school opened recently at Charlottesville, Va. The curriculum: the main-

Whether it's tool belts or safety straps . . . pliers or wrenches . . . grips or climbers, linemen and electricians know they can expect the highest in quality when their equipment carries the name Klein.

For more than a century Klein has been the leader in designing and producing tools and equipment to serve the exacting needs of the utility field.

Today, wherever power lines or communication lines are strung, Klein tools and equipment are in greater demand than ever, assuring safer, speedier line construction and operation.

WRITE FOR FREE TOOL GUIDE
A free copy of the new Klein Pocket Tool Guide will be sent on request.

ASK YOUR SUPPLIER
Foreign Distributor: International Standard Electric Corp., New York

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
N. CORMICK ROAD • CHICAGO 45, ILLINOIS

ENDURPRENE

• DROP • BRIDLE

PREMIUM GRADE INSULATION—TOUGH, ENDURING NEOPRENE JACKET

A COMBINATION HARD TO BEAT FOR LONG-RUN ECONOMY AND RELIABILITY

KELLOGG

DISTRIBUTED BY

KELLOGG

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

MANUFACTURED BY

GENERAL INSULATED WIRE WORKS, INC. PROVIDENCE, R. I.

In attendance at the United States Instrument Corp. school and concentrating on the maintenance, adjustment and servicing of telephone equipment were these Independent telephone men (left to right): C. K. Rice of Simpsonville, S. C.; Paul Maurer of Wilton Junction, Ia.; Jimmy Bowmer of Burkesville, Ky.; William J. Smith of Ellijay, Ga.; Frank Patton and Clyde Garn, USI instructors, and J. Walter Brown of Rock Hill, S. C.

tenance, adjustment and servicing of telephone equipment.

Sponsored by the United States Instrument Corp. (USI), the program consists of a six-weeks training and refresher course in elementary electricity and telephony as well as the fundamentals of telephone equipment maintenance.

The school's first term began on Feb. 10. Its students: representative personnel from telephone companies throughout the country using USI telephone equipment.

Under the direction of USI's telephone engineering department, headed by F. H. Nolke, this institution draws its faculty from several departments of the company. K. W. Howard, F. A. Patton, and Clyde Garn conduct its classes, with the aid of special demonstrations by members of the company's engineering, production, and installation divisions.

Enrollment included: J. Walter Brown of Rock Hill (S. C.) Telephone Co.; William J. Smith of Ellijay (Ga.) Telephone Co.; Jimmy Bowmer of Duo-County Telephone Co., Russell Springs, Ky.; Charles Kenneth Rice of Home Telephone Co., Simpsonville, S. C.; Paul R. Maurer of Wilton Telephone Co., Wilton Jct., Ia.; Jack D. Slaughter of Southern Nevada Telephone Co., Las Vegas, Nev.; Richard Harper of Preston County Light & Power Co., Masontown, W. Va.; and Lyndell M. Armstrong of Virginia Telephone & Telegraph Co., Charlottesville.

Future plans for the school include repeating the course when demand is sufficient. Lectures, discussion and lab work in the present course are followed up by quizzes.

American Creosoting Names Ohio Sales Representative

American Creosoting Corp., a subsidiary of Union Bag—Camp Paper Corp., on Mar. 13 announced the appointment of Robert E. Noland as the company's sales representative in Ohio.

Prior to joining the Amcreco organization, Mr. Noland worked for the Logan Co. in its special metal fabrication division. More recently he was the sales manager for International Aluminum Corp.

Mrs. Maude Alexander, a former operator, who recently retired from the Oregon-Washington Telephone Co., Hood River, Ore., after 40 years of service was honored at a dinner by her fellow employes. When the company's Toppenish, Wash., exchange was converted to automatic operation in 1953, Mrs. Alexander became an assistant cashier at Wapato, Wash.

General Directory Appoints L. J. Mast PR Director

Leland J. Mast has been appointed to the newly created post of director of public relations for General Tele-

L. J. MAST

phone Directory Co. in Des Plaines. His new assignment was effective Feb. 1.

Mr. Mast, who celebrated 20 years with the directory company in 1957, will continue as coordinator of the company's Yellow Pages advertising program and as supervisor of the trade mark service department.

After graduating from Texas Tech in 1931, Mr. Mast joined the staff of the *Avalanche-Journal* in Lubbock, Tex., where he remained until joining General as a sales supervisor in 1937.

Lynch Appoints Bascom Industrial Engineer

J. C. Bascom has been appointed industrial engineer on the staff of Lynch Carrier Systems, Inc., manufacturers of carrier, telephone and multiplexing equipment. His responsibilities will be in connection with improvement of manufacturing procedures, techniques, and related operations.

Prior to joining Lynch, Mr. Bascom was personnel manager and labor relations contact for General Cable Corp., Emeryville, Cal. for five years. Previous to that time he was employed as an industrial engineer with Fayette R. Plumb, Inc., St. Louis, Mo.

His education included study at Yale University and later at Washington University, St. Louis, where he received his B. S. in Engineering Administration in 1939. He subsequently did post graduate work at Purdue University. From 1951 to 1953, Mr. Bascom was instructor at the Night Engineering School of Washington University.

J. C. BASCOM

He was associated in official capacity, 1950-53, with the National Metal Trades Associated and is a charter member of the St. Louis chapter of the American Institute of Industrial Engineers.

BEST for shopping centers

the BN Booth

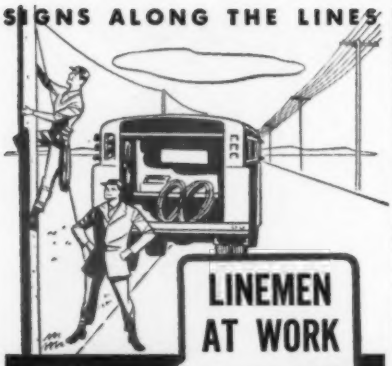
attracts revenue with its colorful, clean appearance ... retains profits with sturdy maintenance-free construction.

The BN Booth is best for you, too!

For full particulars, consult your distributor or write direct for folder... Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

a B-N booth is a busy booth!

SIGNS ALONG THE LINES



LINEMEN AT WORK
USING
Crapo GALVANIZED
GUY & MESSENGER STRAND

Positive strength and durability economies, combined with the superior qualities of steel, make Crapo Galvanized Steel Strand a rugged performer. The heavy, ductile, tightly-adherent galvanized coating — applied by the famous Crapo Process — provides dependable protection for the steel, prolongs the expectant life of the strand. There is a size and grade of Crapo Galvanized Strand for every practical need.

INDIANA
STEEL & WIRE COMPANY, INC.
Muncie, Indiana

For all
TELEPHONE INSTALLATIONS
HILTI® T-25H DRIVE TOOL

Fastens into
CONCRETE, MASONRY,
COMPOSITION BLOCK,
BRICK...EVEN STEEL!
without DRILLING,
PLUGGING, EXPLOSIVES

All you need is
1. A HAMMER
2. THE HILTI T-25H DRIVE TOOL
3. HILTI "CONIC" FASTENERS

and you'll get 85% more holding power with minimum penetration to safely and economically fasten cable-clamps, wire-ties, metal mouldings, wire-clasps, drive-rings, bridle-rings, back-boards, terminals, etc.

For fastenings that hold—hit it with HILTI
Send for FREE literature on the HILTI system

HILTI RAPID FASTENING SYSTEMS, INC.
55 Vandam St., New York 13, N.Y. • AL 5-2292

Graybar Announces Three Managerial Appointments

The Graybar Electric Co., Inc., has announced the following appointments:

R. P. Grosse as district sales manager at Philadelphia, effective May 1.

H. M. Bridges as district operating manager at Kansas City, effective May 16.

Kenneth Brown as manager at El Paso, effective May 1.

Thornhill Publishing Opens New Plant in Kilgore, Tex.

Thornhill Publishing Co. celebrated its 10th anniversary recently by opening a new plant in Kilgore, Tex. to handle the directory-publishing of the companies which it serves in the Southwest.

William A. Smith is sales manager of Thornhill Publishing Co.'s new Kilgore, Tex. branch.

Thornhill has included in its completely remodeled Kilgore building three departments concerned with directory publishing—sales, production and printing. An investment of $50,000 was made in modern, new printing equipment.

Production Manager Hue Ben Ray and Mae Wallace, billing clerk, at Mr. Ray's desk where proofs, contracts and service orders are processed.

View of Thornhill Publishing Co.'s Kilgore printing plant established to handle business in the Southwest.

The company's Texas sales force is presently handling the directories of some 90 exchanges for the Southwestern States Telephone Co., Brownwood, Tex. William A. Smith is sales manager.

General Appoints Midwest Commercial Supervisor

Robert I. Barnes will become general commercial supervisor of the Midwest companies of General Telephone System. This includes General Telephone Co. of Iowa, General Telephone Co. of Missouri and General Telephone Co. of Nebraska. The appointment was announced in New York on Mar. 19 by Donald C. Power, president, General Telephone System.

Mr. Barnes, a native of Columbia, Mo., was graduated from the University of Missouri. He began his employment with the Missouri Telephone Co. in November 1950, and held positions in the commercial and traffic departments. In March 1955, he was named commercial staff assistant for the Union Telephone Co.

Mr. Barnes has been division commercial supervisor of General Telephone Co. of Michigan since 1956. His new duties in the Midwest companies are effective Apr. 1.

EMPIRE
—3-wire & 7-wire Strand
—Stainless & Galvanized Lashing Wire
—Pole Line Hardware
—Specialties for the Communications Industry
EMPIRE STEEL & WIRE CORPORATION
1506 Wesley Ave., Erie, Pa. Phone 86-542

ORDER FROM L. E. S.
AND PAY LESS
CABLE SPLICING TOOLS & SUPPLIES
PROMPT DELIVERY FROM STOCK
Send for Bargain Stock List No. CS.
LINE EQUIPMENT SALES
529 So. Dearborn St., Chicago 5, Ill.

ROBERT E. FOLEY CONSTRUCTION CORP.
DESIGN—SURVEYS—APPRAISALS—Construction and Maintenance of Overhead and Underground Telephone Plant. Complete supply of poles available for emergency requirements.
48 GRISWOLD STREET
BINGHAMTON, N. Y. TEL. 2-7215

TUDOR AND YAGER, INC.
Telephone Construction
TIPTON, INDIANA
Phone OSborne 5-2267

YATES CONSTRUCTION CO.
"Specializing in Telephone Construction"
Cable Splicers, Telephone Installers, Equipment Installers, Construction crews.
1507 SOUTH SIXTH ST. PADUCAH, KY.
TELEPHONE 2-4623

KILLOREN COMPANY
Construction crews—Installers
Cable Splicers
30 years experience
136 N. State St. Appleton, Wisconsin
REgent 3-5549

CABLE SPLICERS • LINEMEN
STATION INSTALLERS
STEADY WORK, GOOD PAY
MIDWEST LOCATION.
The Weikel Line Company, Inc.
FORT WAYNE, IND.

HARRIS-McBURNEY CO.
PUBLIC UTILITY CONSTRUCTION
A complete construction service for the telephone industry
Construction Crews Engineering
Station Installers Appraisals & Reports
Cable Splicers C. O. Installation
Underground Duct Systems
Telephone ST 4-6126
P. O. Box 267 Jackson, Michigan

Complete outside telephone plant builders. From frame to the phone
MULLEN CONSTRUCTION COMPANY
2002 E. Wisconsin Ave. REgent 4-9881
Appleton, Wisconsin

Construction Crews Station Installers
Central Office Installations
Cable Splicers Complete Engineering
HENKELS & McCOY
6100 North 20th Street Philadelphia, Pa.
Now Operating in 30 States
OFFICES LOCATED AT
Elkhart, Ind. .....Tel. 2-5650
Ashland, Ohio .....Tel. 3-7543
St. Johns, Mich. .....Tel. 966
Bloomington, Ill. .....Tel. 6-1850
Schofield, Wisc. .....Tel. 9-2542
Ocala, Fla. .....MArion 9-1284
PERFORMANCE Has Built Our Business

ATLANTIC
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
Creosoted Pine Poles • Crossarms
PLANTS AND OFFICES
Boston, Mass. Portsmouth, Va.
New York, N. Y. Philadelphia, Pa.
Savannah, Ga.

INSPECTION SERVICE AT TIMBER TREATING PLANTS
Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Consulting and specification writing.
Inspectors stationed throughout U.S.A.
A.W.WILLIAMS INSPECTION CO., INC.
MOBILE, ALABAMA

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co.—Northern White Cedar Poles. Pentachlorophenol treated. Plant and Yards. Phelps, Wis.

Dierks Forests, Inc. (formerly Dierks Lumber & Coal Co.) Wood Preserving Division, 810 Whittington Ave., Hot Springs, Arkansas. Southern Pine select poles, all sizes and lengths, creosote and penta-pressure treated. Prompt shipment.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

International Paper Co., Long Bell Division, 926 Grand Ave., Kansas City, Mo. —Pressure-treated Southern Pine and Douglas Fir Poles. Creosote and Penta preservatives.

Montana Pole & Treating Plant—Box 2004, Butte, Montana. Penta-Pressure treated Lodgepole Pine and Western Larch Poles. Inquiries invited.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

CABANISS-POGUE COMPANY
Consulting Engineers
Appraisals—Cost and Rate Studies
Financial Assistance
GRANT BLDG., ATLANTA, GEORGIA

CARL C. CRANE, INC.
Consulting Engineers
2702 Monroe Street, Madison 5, Wis.
Telephone CEdar 3-4210

ENGINEERING ASSOCIATES, INC.
Consulting Engineers
79 W. PEACHTREE PLACE, N. W.
ATLANTA, GEORGIA
TELEPHONE: JAckson 3-5925

McGRATH ENGINEERING, INC.
Consulting Engineers
209 West 6th Street
TOPEKA, KANSAS
Telephone CE 2-2358

SLOAN, COOK & LOWE
CONSULTING ENGINEERS
Appraisals—Original Cost Studies
Plant, Traffic and Commercial Engineering
120 S. La Salle St.
Chicago 3, Ill. Tel: FRanklin 2-5924

FOR ALL OF YOUR CENTRAL OFFICE AND PBX INSTALLATIONS, MODIFICATIONS, AND ENLARGEMENTS, IT'S THE
T. E. I.
TELEPHONE ELECTRONICS INSTALLATION CORP.
Hayes Bldg., 12 E. Tenth St., Erie, Pa.
CAN WE BE OF SERVICE TO YOU?

CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less.
Classified advertisements must reach us 8 days before publication date.

HELP WANTED

INSTALLATION FOREMEN – SUPERVISORS

Kellogg Switchboard & Supply Company, a progressive, expanding telecommunication manufacturer, has several openings for men with a minimum of five years experience as Central Office equipment installation foremen or supervisors. These positions require familiarity with all phases of dial or manual equipment installation and testing. You will travel and work on commercial and government projects within the United States in the capacity of supervisor over large Central Office installations.

To qualified applicants Kellogg offers:

48-hour work week with time and a half for over 40 hours, plus expenses for 7 days a week.

Company-paid retirement plan.

Group insurance.

OPPORTUNITY to grow with a rapidly expanding division of the world-renowned International Telephone and Telegraph Corporation.

Submit résumé to:

G. W. Compton
KELLOGG SWITCHBOARD & SUPPLY COMPANY
6650 S. Cicero Ave.
Chicago 38, Ill.

ENGINEER WANTED—Excellent opportunity available with a fast growing telephone company in Florida. Job requires degree in engineering and at least fifteen years of outside (cable and open wire) plant engineering experience. Submit outline of education, employment history, telephone experience and salary requirements, including age, references and recent photograph to Box No. 4070, c/o TELEPHONY.

HELP WANTED

WANTED: Telephone Installers, Cable Splicers, Linemen, Central Office Installers. Yates Construction Company, 1507 South 6th St., Paducah, Kentucky. Telephone 2-4623.

CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1211 Kenmore Avenue, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

PLANT ENGINEERS for large Independent Telephone Company. Some experience necessary. In reply state age, educational and employment history. Address reply to Personnel Supervisor, Rochester Telephone Corporation, 10 Franklin Street, Rochester 4, N. Y.

TELEPHONE SWITCHMAN — Independent company operating 4000 line exchange in southern university town of 18,000 population seeks the services of a capable supervising switchman. Man must be thoroughly trained in the maintenance, planning and installation of Automatic Electric line switch and line finder equipment and must be able to furnish good references. Submit complete résumé of experience, training and education. Write Box 4072, c/o TELEPHONY.

POSITION WANTED

MARRIED MAN, 28, desires job maintaining exchange with telephone company in Midwest. Has nine years automatic equipment experience with present company. Write Box No. 4074, c/o TELEPHONY.

POSITION WANTED

EXPERIENCED PLANT SUPERINTENDENT, 34, long and varied experience C.O. and outside plant, dial conversion, personnel, public relations. Civic minded. Capable of full responsibility. Want to relocate with system of 3000 or more stations. Write Box 4071, c/o TELEPHONY.

FOR SALE

Western Electric type 1011 Rubber Test Sets with large or small dial. Rebuilt $25.00 each. Telephone Equipment, Inc., Montrose, Mich.

PAYSTATION AUTELCO 62-55 dime prepay dial service. New. First $125 takes. Write Box No. 4075 c/o TELEPHONY.

ONE POSITION, 80 LINE Automatic Electric Magneto switchboard. Good condition. Available immediately. Farmers' Mutual Telephone Co., Nora Springs, Ia.

KELLOGG DECIMONIC RINGERS, all cycles—fit WE 302 telephones. Kellogg straight-line ringers for 1000 series telephones. Walker County Telephone Co., LaFayette, Ga.

50 LEICH 901 TELEPHONES. Like new. $17.50 each. 100 rebuilt handsets with new Neoprene, four conductor cords for wall telephones. $3.50 each. Telephone Co., Turtle Lake, Wisc.

NORTH CX 60 SWITCHBOARD equipped with 40 lines, three links, one trunk. Six years old, available immediately. Inquire Manager, Deuel Telephone Cooperative Association, Clear Lake, S. D.

ONE LOT CONSISTING of 18 positions Kellogg switchboards and other miscellaneous items. For complete details write West Coast Telephone Co., P.O. Box 1003, Everett, Wash., Attention: Purchasing Agent.

REBUILT DIALS
WESTERN ELECTRIC No. 5-H — with metro face.
A. E. No. 24—with metro face.
Stromberg No. CE. 2—with dust covers.
Prices FOB Chicago. @ $3.50 each.
Independent Telephone Repair Co.,
2137 West 21st St., Chicago 8, Ill.

BELLS EXTENSION W.E. No. 592-AW. New @ $7.50 each.
Calculagraphs Model 33—with transformers—20-volts. Used. $35.00 each.
Subcycle Model M 7.5—Rebuilt @ $25.00 each.
Quotations FOB Chicago, Ill.
Independent Telephone Repair Co.
2137 W. 31st St. Chicago 8. Ill.

AVAILABLE FOR IMMEDIATE DELIVERY one brand new Kellogg 7-3 Cross-bar switchboard of 550 lines and 1200 connector terminals. This equipment has not been in service and is available for inspection at Lake Crystal, Minn. Contact Mankato Citizens Telephone Co., Mankato, Minn.

RECONDITIONED NOW IN STOCK EXCELLENT

QUANTITY	ITEM
500	W.E. #BIAL Ringers (Straight Line)
100	W.E. #94-E, 94-F, 120-C Repeat Coils
100	W.E. #120-G Repeat Coils
500	W.E. #AB-1 and AB-2 Line & Cutoff Relays
200	W.E. #6017-E Key Boxes (3-Way)
75	W.E. #1268-A, 1269-A Protection
25	W.E. #22-C Combined Jacks and Signals on #89-B Mtg. (5 per)
10	W.E. #31-C Combined Jacks and Signals on #89-C Mtg. (5 per)
100	W.E. Rotary Stepping Switches #SS-5, SS-6, SS-7
5000	W.E. #E-R-U and B Type Relays

Whatever Your Needs . . . It Pays to Call BUCKEYE

BUCKEYE TELEPHONE & SUPPLY CO.

Dept. T, 1250 Kinnear Rd. Columbus 21, Ohio
Phone HUdson 8-0655

FOR SALE

CONVERTING TO DIAL? Let us make it easy for you. We can furnish immediately, to your specifications, a North CX-100 or CX-200 Automatic Switchboard in excellent condition. We can install it for you. We can also furnish rebuilt dial telephones for your entire system. Ask about our financing plan. Telephone Equipment, Inc., Montrose, Mich., Telephone NEptune 9-5211.

ELEVEN I.B.M. electric toll billing typewriters. All machines are in good operating condition and have been covered by I.B.M. maintenance contracts since new. 4 machines purchased new 1947—Price $25.00 ea. 7 machines purchased new 1951—Price $40.00 ea. Price FOB Everett, Wash. For further information write Purchasing Agent, West Coast Telephone Co., P. O. Box 1003, Everett, Wash.

WANTED TO BUY

TELEPHONE COMPANY of 300 or 400 stations in Virginia or West Virginia. Write Box No. 4073, c/o TELEPHONY.

MAGNETO TELEPHONES AND PARTS. Highest market prices. Write Telephone Company, Turtle Lake, Wisconsin.

FOUR GOOD USED OUTDOOR PAY STATION booths; state type, condition and price. Cream Valley Telephone Co., Hawkins, Wisc.

WANTED—RETIRED TELEPHONES AND ACCESSORIES, any quantities and makes. Bohnsack Equipment Co., Germantown, N. Y.

PHANTOM COILS IN PAIRS enclosed in terminal or housing with protection. Prefer Stromberg-Carlson No. 15 coils. Redwood County Telephone Co., Redwood Falls, Minn.

TELEPHONES—all types—any condition; candlesticks, wall sets, etc. Write advising quantities available. Our truck will pick up. Reply to Box No. 3952, c/o TELEPHONY.

CASH AVAILABLE for common and preferred stocks or bonds of telephone operating companies. Write Box No. 4050, c/o TELEPHONY.

We are happy to announce that as of APRIL 1st, 1958 our New York Office and Warehouse will be in New, Larger, More Efficient Quarters.

Our New, Spacious Warehouse will make it possible to stock more materials so that we can continue to give you our usual prompt service with greater efficiency.

NEW ADDRESS
TELE-WIRE SUPPLY CO., INC.
178-10 Liberty Avenue
AXtel 7-4756
Jamaica 33, New York

CABLE* lead, PVC, Neoprene **SAVE**
Western Electric (all new)

909 pr. #22 ga. (single paper lead, jute)
20 reels, 330 ft. per reel

1515 pr. #24 ga. (single paper lead)
10 reels, 630 ft. per reel
all above cable f.o.b. So. Central location

7 quad #19 ga. (single paper lead jute)
20 reels, 3000 ft. per reel

SUBMARINE CABLE — 20 pr. #19 ga. (double steel wire armor, jute) 1 reel, 500 ft.

ANKOSEAL, type 275, 101 pr. #22 ga. (color coded) PVC jacket & ins. 3 reels, 1000 ft. per reel

NEOPRENE jacket, 5 pr. #19 ga. color coded, 1000 ft. reels, 5c ft.; 10 pr. # 19 ga. color coded, 1000 ft. reels, 10c ft.
above three items f.o.b. Los Angeles

Limited Supply

COPPERWELD LINE WIRE, # 12 (.080") 40% cond.
new factory coils (average 100 lbs.)
A-1 export wrapped.....37c lb.
slightly tarnished .....32c lb.
quantity discounts FOB Los Angeles

Shipped on Approval

The Telectric Co.

1218 Venice Boulevard **Los Angeles 6, California**
Richmond 8-2249

NOTICE

NEW GOVERNMENT RELEASE
We Will Not Be Undersold

5 PAIR, #19 ga.

NEOPRENE JACKETED CABLE

TOUGH ABRASION RESISTANT ★ AERIAL OR UNDERGROUND
COLOR CODED • SOLID TINNED COPPER CONDUCTORS • RUBBER INSULATED • UNUSED A-1—1,000 ft. LENGTHS ON SEALED NO-CHARGE STEEL REELS • *While Quantities Last*

$27.50 per 1,000 ft. REEL

Write for quantity discount
PRICE F. O. B. CHICAGO

REUBEN R. GRAFF CO. ORDER TODAY
6114 So. WENTWORTH AVE.
CHICAGO 21, ILL. NO7-6400

TERMS: 25% DEPOSIT WITH ORDER. BALANCE C. O. D. RATED FIRMS: NET 10 DAYS

Index to ADVERTISERS

	Page
Acme Visible Records, Inc.	—
Alphaduct Wire & Cable Co., The	57
Aluminum Company of America	—
American Chain & Cable Co., Inc.	
Page Steel & Wire Div.	—
Wright Hoist Div.	—
American Creosoting Corporation	—
American Electrical Heater Co.	—
American Gage & Mfg. Co.	—
American Steel & Wire Co.	—
American Telephone & Telegraph Co.	46-47
American Teletype Parts Corp.	62
Anaconda Wire & Cable Co.	—
Ansonia Wire & Cable Co., The	43
Arrow Fastener Co., Inc.	—
Atlantic Creosoting Co., The	67
Automatic Electric Sales Co.	10-11, 36-37
Bakelite Company	—
Baker Wood Preserving Co.	—
Barber-Greene Co.	—
Bartlett Tree Experts	—
Bashlin Company, W. M.	—
Bell Telephone Laboratories, Inc.	—
Benner-Nawman, Inc.	65
Berry & Co., L. M.	—
Bethlehem Steel Co.	—
Biddle Co., James G.	—
Bishop Manufacturing Corp.	—
Blaw-Knox Company	—
British Insulated Callenders' Cables, Ltd.	—
Buckeye Telephone & Supply Co.	68
Burgess Manning Company	—
Burroughs Corp.	—
C&D Batteries, Inc.	41
Cabaniss-Pogue Co.	67
Cable Spinning Equipment Co.	—
Calculagraph Company	71
Chance Co., A. B.	—
Chase Brass & Copper Co.	—
Cleveland Inst. of Radio Electronics	35
Colorado Fuel & Iron Co., The	55
Commercial Cord and Supply Co.	—
Communication Equipment & Engineering Co.	—
Consolidated Electrodynamics Corp.	—
Cook Electric Company	—
Copperweld Steel Co.	16
Crane, Inc., Carl C.	67
Cullom & Ghertner	—
Cushman Motor Works, Inc.	—
Davis Construction Co.	—
Diamond Expansion Bolt Co., Inc.	—
Donnelley & Sons, R. R.	—
Dow Chemical Co., The	—
Duo-Safety Ladder Corp.	58
Edmund Scientific Company	—
Elbe File & Binder Co., Inc.	—
Electric Specialty Co.	—
Electrix Corporation	—
Empire Steel & Wire Corp.	66
Engineering Associates, Inc.	67
Engineers Tool Co.	62
Everstick Anchor Co.	—
Exide Industrial Division— The Electric Storage Battery Co.	51
Fitchburg Engineering Corporation	—
Foley Construction Co., Robert E.	67
General Cable Corporation	—
General Insulated Wire Works, Inc.	64
General Machine Products Co., Inc.	—
General Telephone Directory Co.	Back Cover
Goodrich Chemical Co., B. F., The	—
Gorman-Rupp Company	59
Gould-National Batteries, Inc.	—
Graybar Electric Co.	—
Greenlee Tool Co.	—
Haley & Co., R. G.	—
Harris-McBurney Company	67
Henkels & McCoy	67
Highway Trailer Company	—
Hilti Rapid Fastening Systems, Inc.	66
Hirsch Organization, Inc., Gustav	55
Holan Corp.	29
Holub Industries, Inc.	—
Homelite Corp.	—
Hubbard & Company	49
Indiana Steel & Wire Co.	66
Ingram-Richardson Mfg. Co.	—
International Business Machines Corp.	—
International Harvester Co.	—
Irwin Auger Bit Co.	—
Johns-Manville	—
Kander & Company, Allen	—
Katolight Corp.	—
Kearney Co., Jas. J.	—
Kellogg Switchboard & Supply Co.	6-7, 26-27, 60-61
Kennecott Wire & Cable Co.	—
Killoren Company	67
Klein & Sons, Mathias	63
Kleinschmidt Laboratories, Inc.	—
Koiled Kords, Inc.	—
Koppers Co., Inc.	56
Leich Sales Corporation	12-13
Lindsay Telephone Supply Co.	—
Line Equipment Sales	66
Lorain Products Corp., The	5
Lynch Carrier Systems, The	—
Magnolia Chemical Company, Inc.	62
McCabe-Powers Auto Body Co.	—
McFarland Company, L. D.	—
McGrath Engineering, Inc.	67
Monsanto Chemical Co.— Plastics Div.	—
Morrison-Pelsue Co.	—
Mullen Construction Co.	67
Murphy Engineering Laboratories	59
Natco Corporation	—
National Pole & Treating Div.	—
National Standard Co.	39
National Telephone Supply Co.	—
Neubauer Manufacturing Co.	—
Neuses, Inc., P. K.	—
North Electric Company	14-15
Onan & Sons, D. W.	—
Orangeburg Manufacturing Co., Inc.	—
Osmose Wood Preserving Co.	—
Owens-Illinois	—
Page & Hill, Inc.	—
Parker, W. H.	—
Phelps, Dodge Copper Products Corp.	8-9
Philco Corp., Gov't. & Industrial Div.	—
Piedmont Wood Preserving Co.	—
Plymouth Industrial Products, Inc.	—
Porcelain Products, Inc.	—
Porter, Inc., H. K.	—
Preformed Line Products Co.	25
Pressed & Welded Steel Products Co.	—
Prodelin, Inc.	—
Radio Engineering Products, Ltd.	—
Radio Frequency Laboratories, Inc.	—
Ramset Fastening System	—
Raytheon Mfg. Company	—
Recordak Corp.	—
Reichhold Chemicals, Inc.	—
Reliable Electric Company	45
Remington Rand Div.	—
Rex Corporation, The	—
Roebling's Sons Corp., John A.	—
Rohn Manufacturing Co.	54
Rolatape, Inc.	—
Roper Manufacturing Co.	—
Runzel Cord & Wire Co.	—
S&G Manufacturing Corp.	48
Schauer Mfg. Co.	52
Seymour Smith & Sons, Inc.	—
Sherron Metallic Corp.	—
Sierra Electronics Corp.	—
Sloan, Cook & Lowe Co.	67
Stahl Metal Products	—
Stainless, Inc.	—
Stewart Bros.	62
Stromberg-Carlson Co.	2-3, 67
Superior Cable Corporation	—
Suttle Equipment Corporation	—
Taylor-Colquitt Co., The	—
Telectric Co.	69
T.E.I. Corp.	67
Tele-Muff Co.	—
Telephone Training Institute	53
Teletype Corp.	—
Tele-Wire Supply Co., Inc.	69
Telkor, Inc.	—
Templeton, Kenly & Co.	—
Thornhill Publishing Co.	—
Transandean Associates, Inc.	—
Truck Equipment Company	—
Tudor & Yager, Inc.	67
United Electric Controls Co.	—
U. S. Cable Constructors, Inc.	—
United States Independent Telephone Association	—
United States Instrument Corp.	—
United States Motors Corp.	50
United States Steel Corp.	
American Steel & Wire Co.	—
Creosote Division	—
Universal Controls Corp.	—
Utica Drop Forge & Tool Div.	—
Utility Body Co.	—
Utility Tool & Body Co.	—
Weikel Line Company	67
Western Electric Co.	—
White Motor Co., The	—
Whitney-Blake Co.	—
Wickmire Spencer Steel Division of CF&I	55
Williams Inspection Co., A. W.	67
Wiremold Co., The	—
Wyoming Valley Equipment Div.	—
Yates Construction Co.	67
York-Hoover Corporation	—

WESTERN REPRESENTATIVE: McDonald-Thompson, 625 Market St., San Francisco, Cal.; 3727 W. Sixth St., Los Angeles; Colorado National Bank Bldg., Denver, Colo.; National Bldg., Seattle, Wash.; 3217 Montrose Blvd., Houston, Tex.; 2010 S. Utica, Tula, Okla.; 912 S. W. Market St., Portland 1, Oregon.

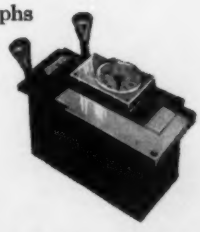
now YOU CAN USE ANY SIZE TOLL TICKET WITH THE NEW CALCULAGRAPH SET-BACK HANDLE

Here's still another new feature that makes Calculagraph the best and easiest method to time toll calls—it's the new set-back handle that enables you to use ANY SIZE toll ticket.

This new Calculagraph development brings to *three*, the number of major advancements in the past year alone—the 60-minute dial, colored handles and now the set-back handle.

These are 3 more good reasons why Calculagraphs should be in your switchboard to make toll call timing easier for your busy operators.

Write today for complete information that tells how Calculagraphs can be used in your switchboard.



CALCULAGRAPH Company

308A Sussex Street • Harrison, New Jersey

MANUFACTURERS OF ELAPSED TIME RECORDERS FOR OVER 65 YEARS

Directories show more profit

when our "Revenue Men" take over

OUR DIRECTORY "Revenue Men"—working from 32 strategically located sales offices—providing the Independent Telephone Industry with a flexible and highly skilled telephone directory organization, are equipped to render a Complete and Quality Directory Service.

These specialists, through the use of up-to-the-minute knowledge of the market—proper sales training—imagination—ideas—leadership—and hard work, produce results which more than measure up to accepted directory revenue standards.

Yes, the "Yellow Pages" revenues in the more than 800 directories we now produce for large and small Independent Telephone Companies prove the statement: "DIRECTORIES SHOW MORE PROFIT WHEN OUR 'REVENUE MEN' TAKE OVER."

Write or phone our office nearest you for our Complete Directory Service Plan.

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Oakton Street • DES PLAINES, ILLINOIS • VAnderbilt 4-2164

Divisional Sales Offices:

COLUMBIA, Mo. • 811 Cherry Street • Gibson 2-6907
DURHAM, N. C. • 108 E. Parrish Street • Tel.: 5133
ERIE, Penna. • G. Daniel Baldwin Building • Tel.: 2-4187
FORT WAYNE 2, Ind. • 229 E. Berry Street • Eastbrook 3477
HONOLULU 14, Hawaii • 1236 Waimanu St. • Tel.: 504-231
LEXINGTON, Kentucky • 157 Walnut Street • Tel.: 4-7626
LONG BEACH 15, Calif. • 1775 Ximeno Ave. • GEneva 3-7441
MADISON 3, Wisconsin • 214 N. Hamilton St. • ALpine 7-1667
MANILA, Philippine Islands • P. O. Box 673
SAN ANGELO, Texas • 110 South Taylor St. • Tel.: 6738
SPOKANE, Wash. • South 11 Monroe • MAdison 4-4336
SPRINGFIELD, Ill. • Myers Bros. Building • Tel.: 8-3425